

Contract Plan, Specifications & Estimate Preparation

Fall 2009



**Washington State
Department of Transportation**

Environmental and Engineering Programs
Design Office

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

PROJECT DEVELOPMENT TRAINING

A4J - Contract Plan & Estimate Preparation

BGN – Contract Provision Preparation

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Course Objectives

Course Title: Contract Plans & Estimate Preparation

Course Code: A4J

Date: _____

Location: _____

Instructor(s): _____

AFTER SUCCESSFUL COMPLETION OF THIS COURSE,
THE STUDENT WILL BE ABLE TO:

- ✓ determine which plan series to include in your project
- ✓ identify resources you will need to prepare each plan series
- ✓ prepare and assemble contract plans in accordance with the Plans Preparation Manual
- ✓ use the Standard Item Table to select contract bid items
- ✓ establish unit prices using bid-based or cost-based methods
- ✓ calculate and transfer quantity take-offs from Plans to the Tabulations and the Summary of Quantities
- ✓ use EBASE to prepare the Engineer's Estimate
- ✓ make funding, group and column determinations for the Summary of Quantities
- ✓ include a non-standard item in the contract

This course provides engineers and technicians with the knowledge and skills necessary to prepare plans and engineering estimates for WSDOT highway construction contracts. The focus will be on using WSDOT's Plans Preparation Manual as a reference.

Manuals used:

WSDOT Plans Preparation Manual

WSDOT Standard Plans

WSDOT Standard Specifications

Let's test your knowledge

1. The “normal” scale of 11” x 17” advertised contract plans is: (Circle one)
 - a. 1” = 20’
 - b. 1” = 50’
 - c. 1” = 100’
 - d. 1” = 200’
2. Every Plan View sheet is required to have: (Circle all that apply)
 - a. Begin/End Project callout
 - b. Scale Bar
 - c. Township/Range
 - d. North Arrow
 - e. Legend or cross reference to Legend
3. Sequence the following plan sheets in accordance with Plans Preparation Manual.

_____	Quantity Tabulations for Site Preparation
_____	Roadway Sections
_____	Vicinity Map
_____	Summary of Quantities
_____	Site Preparation
4. A Vicinity Map is required on every project.

TRUE FALSE
5. Besides the Design Team, who else contrubites to the PS&E package?

Introduction

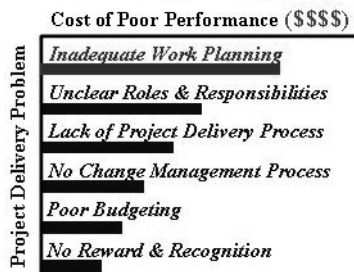
Understanding the Purpose

This class, and the Plans Preparation Manual, is intended to show representative information and examples that the designer can, and should, use as a basis to make decisions on what is required, what is to be included in the Contract Plans, Specifications & Estimate (PS&E), and how it is to be shown.

Challenges to Project Delivery

Top 6 Causes Project Delivery Problems

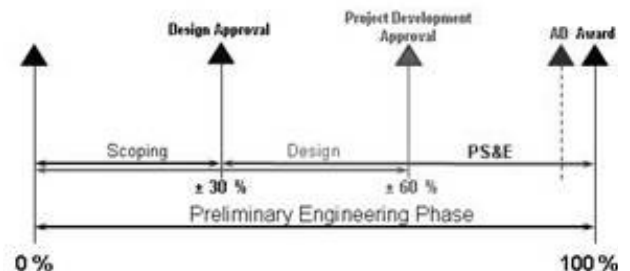
Source: CH2M Hill, Managing Project Delivery (TRANSPED)



No matter how complex a project is or what the scope of the project is, problems develop when we don't use existing processes.

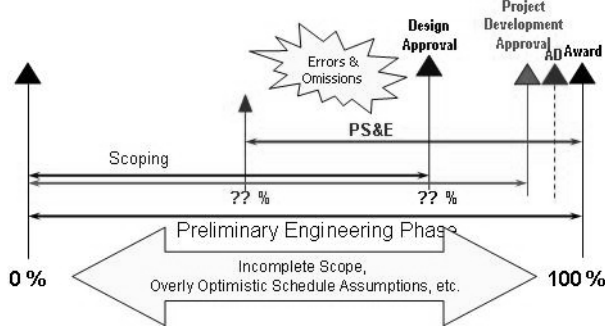
There are 3 stages associated with Preliminary Engineering.

Project Development



Project Development

Problems Will Occur When . . .



Problems occur when the scope of a project is _____ or _____ are made after the design of a project has been started.

This could affect the schedule of the project. Meaning additional time to redo work would be required. However, more times than not, we try to make the changes fit into the existing schedule and by trying to fit more work in a shorter schedule is where we start seeing error and omission to the plans occur.

Challenges to Plan Quality

In 1995 all regions participated in the Plan Quality Initiative - to identify elements that (negatively impact) affect the quality of our plans and to address how to improve the quality of plans to reduce the cost of doing business.

Plan Quality issues raised statewide were:

- ✓ Late changes to or initially incomplete project **scope**
- ✓ **Budgets** set without complete input during the programming phase
- ✓ PS&E turn-in **schedules** that are not quality driven
- ✓ Lack of **communication** and **coordination** between groups
- ✓ Failure to address **support groups** early enough in the process
- ✓ Unrealistic workloads for **support groups** due to inadequate planning and scheduling
- ✓ **Consultants' contracts/scopes of work** not detailed enough
- ✓ WSDOT staff not trained in **consultant management**
- ✓ Poor quality **as-builts**
- ✓ Inaccurate **survey control** and **field verification**
- ✓ Inadequate **subsurface investigations** during design phase
- ✓ Inaccurate location of **existing overhead and underground utilities** on the plans
- ✓ Inaccurate, inadequate and incomplete **base maps**
- ✓ Advertised **PS&Es** containing un-constructable, conflicting or missing items
- ✓ **Addendums** are not reviewed / Addendum process delays

Order of Precedence

1-04.2 Coordination of Contract Documents, Plans, Special Provisions Specifications, and Addenda

The complete contract includes these parts: the contract form, bidder's completed proposal form, contract plans, contract provisions, standard specifications, standard plans, addenda, various certifications and affidavits, supplemental agreements, change orders, and subsurface boring logs (if any). These parts complement each other in describing a complete work. Any requirement in one part binds as if stated in all parts. The Contractor shall provide any work or materials clearly implied in the contract even if the contract does not mention it specifically.

Any inconsistency in the parts of the contract shall be resolved by following this order of precedence (e.g., 1 presiding over 2, 3, 4, 5, 6, and 7; 2 presiding over 3, 4, 5, 6, and 7; and so forth):

In which order do they rule?

_____	Proposal Form
_____	Contract Plans
_____	Standard Plans
_____	Addenda
_____	Standard Specifications
_____	Special Provisions
_____	Amendments

On the contract plans, working drawings, and standard plans, figured dimensions shall take precedence over scaled dimensions. This order of precedence shall not apply when work is required by one part of the contract but omitted from another part or parts of the contract. The work required in one part must be furnished even if not mentioned in other parts of the contract.

If any part of the contract requires work that does not include a description for how the work is to be performed, the work shall be performed in accordance with standard trade practice(s). For purposes of the contract, a standard trade practice is one having such regularity of observance in the trade as to justify an expectation that it will be observed by the Contractor in doing the work.

In case of any ambiguity or dispute over interpreting the contract, the Engineer's decision will be final as provided in Section 1-05.1.

2008 Standard Specifications

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Plan Preparation Requirements

The facts and nothing but the facts

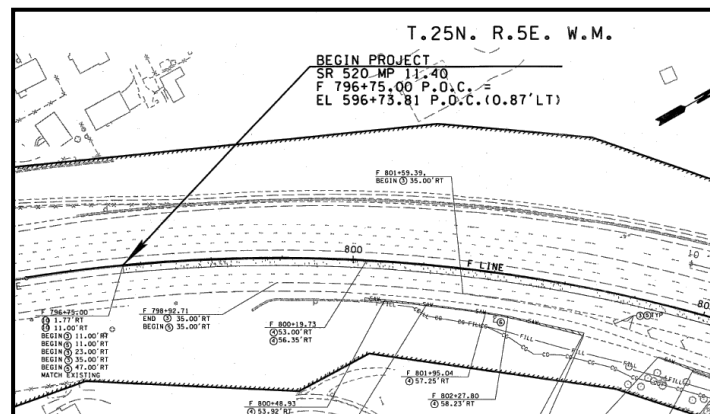
It should be understood that the main responsibility of the designer is to assemble a package that contains the precise information required by a contractor to submit a responsible bid and for WSDOT to get an acceptable finished product. Providing too much information can, at times, cause as many problems as not providing enough.

Drafting Requirements

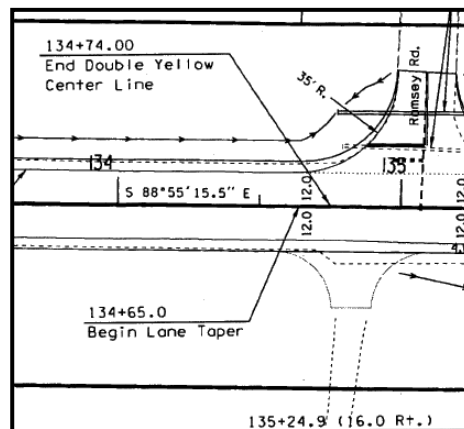
Clutter can cause confusion

The designer also needs to determine what information does not add value and only serves to clutter the plans and create confusion for the reader.

Right of way lines that have no ties add no value. If right of way needs to be shown, it should have ties showing where it is.



Showing existing pavement markings/edge of existing roadway on paving plans or pavement marking plans can cause confusion.



The designer shall avoid the practice of cross-hachuring, or polka-dotting, or shading of large areas to represent areas to be paved, planed or anything else. The roadway sections will adequately show the areas to be planed and paved. The use of large areas of cross-hachuring only hides or distract from the rest of the information being displayed on the sheet

Shading

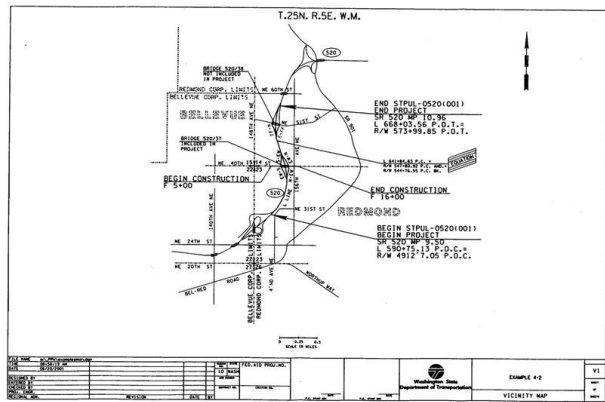
Shading is reserved for highlighting addendum items

See Appendix 5	D4-5	153+26 (30' RT.)	1
	D4-6	153+34 (37' LT.) TO 153+44 (22.5' LT.)	
	D4-7	153+39 (28' RT.) TO 153+81 (28.9' RT.)	1
	D4-8	153+44 (22.5' LT.) TO 153+73 (22.5' LT.)	
	D4-9	153+73 (22.5' LT.) TO 153.73 (36.5' LT.)	
	D4-10	153+73 (22.5' LT.) TO 154+96 (32.2' LT.)	
	D4-11	153+81 (28.9' RT.)	
	D4-12	154+91 (43' LT.) TO 154+96 (32.2' LT.)	

Plan Scale

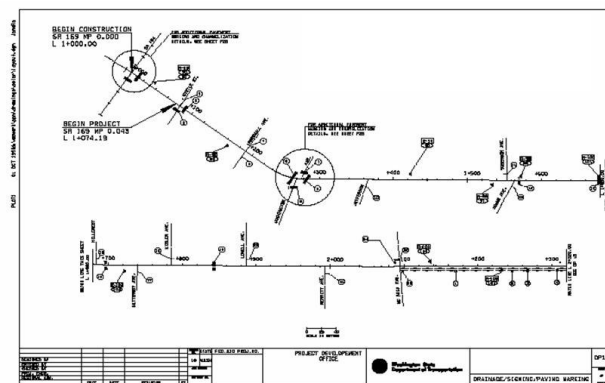
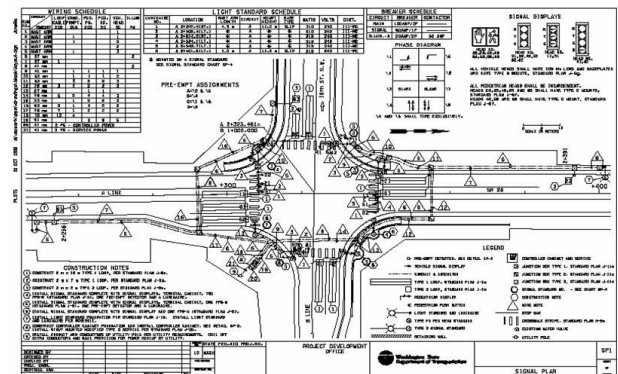
Normal practice, the scale for all 11"x17" plan sheets is to be 1 inch equals 100 feet. However there are exceptions.

There are three exceptions to the 100 Scale



Vicinity Maps use a _____ to show the entire project, including all work on ramps, side roads, county roads, etc

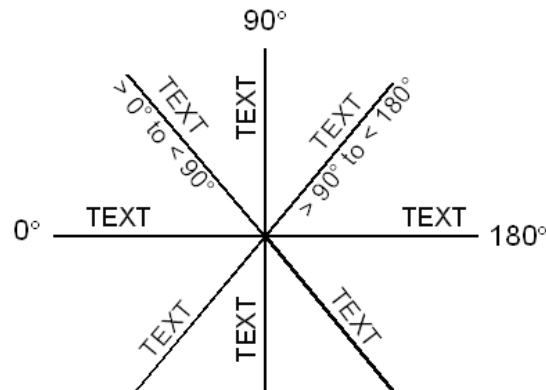
Plan sheets that show a lot of detail - One example of a sheet that displays a great deal of information in a small area would be a Signal Plan.



When _____, strip maps can be used. Use a scale that will be large enough to display the required info, (you can cross reference, to other sheets for detail where needed, using Sheet Reference numbers)

Right Reading Text

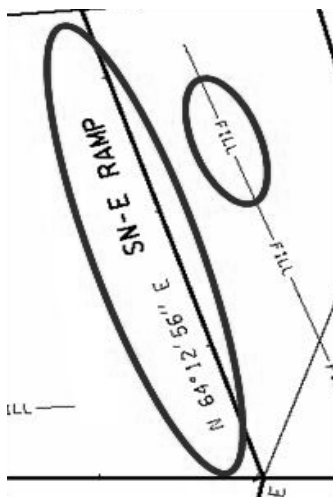
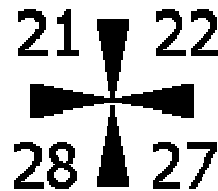
Text shall be right reading from _____ or _____ side.



Right Reading Text Exceptions

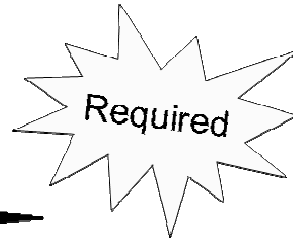
The two exceptions to the bottom and right reading text are:

All section corner and township line numbers shall have their tops to the north, and range line numbers shall have their tops to the west, regardless of the orientation of north to the sheet.



All information identifying a center line, such as line designation, stationing, tick marks, and bearings, shall be placed on top of the line and read left to right, with both the top of the line and left to right being based on the direction of the stationing.

All Plan Views **shall include:**








North Arrow



Scale Bar



Legend*

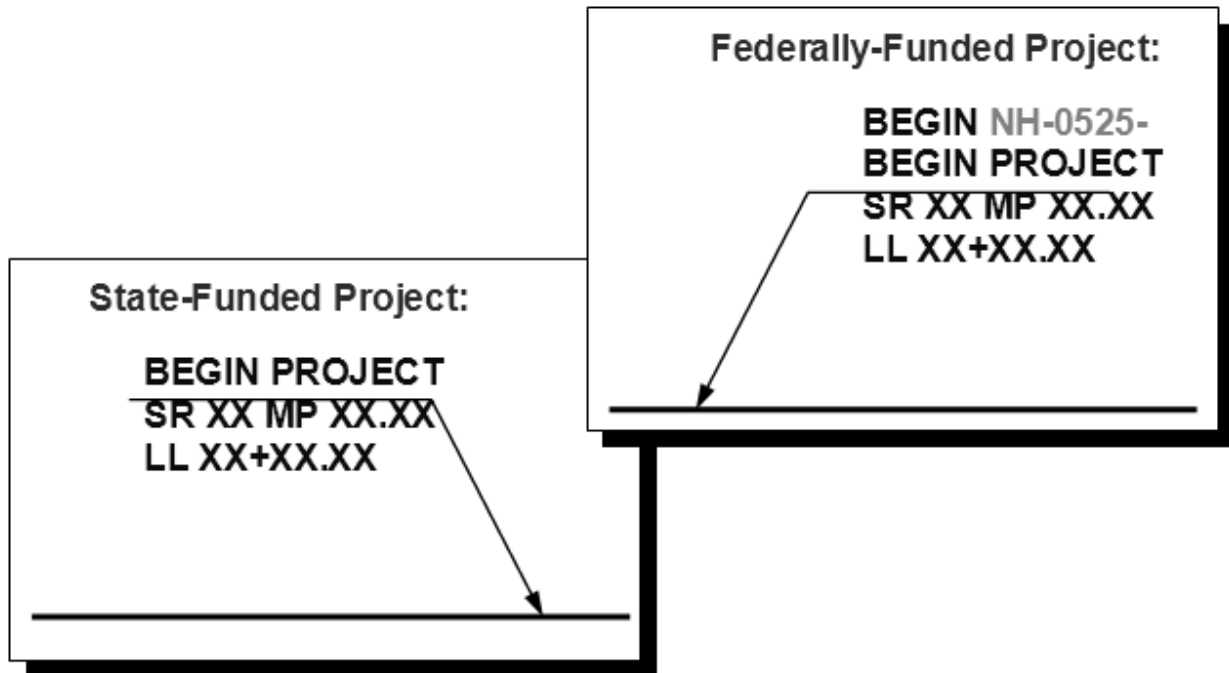
LEGEND	
EXISTING MONUMENT	
EXISTING OVERHEAD POWER	-DP- -DP-
EXISTING STORM SEWER	-ST- -ST-
SIGN	
CROSSWALK	
STOP BAR	
EXISTING CATCH BASIN	

Which of the following requires a north arrow, scale bar, and a legend?

___ Drainage Profiles ___ Paving Plans ___ Detail Sheets ___ Quantity Tabs

For sheets with no room for a Legend, cross reference a *previous sheet* where the LEGEND may be found.

Every Plan and Profile sheet that physically contains Begin or End of Project shall identify these points as:



Plan Sheet Sizes and Layouts

INDEX			INDEX (CONTINUED)		
SHEET NO.	PLAN REFERENCE NO.	TITLE	SHEET NO.	PLAN REFERENCE NO.	TITLE
1	101	101	101	101	101
2	102	102	102	102	102
3	103	103	103	103	103
4	104	104	104	104	104
5	105	105	105	105	105
6	106	106	106	106	106
7	107	107	107	107	107
8	108	108	108	108	108
9	109	109	109	109	109
10	110	110	110	110	110
11	111	111	111	111	111
12	112	112	112	112	112
13	113	113	113	113	113
14	114	114	114	114	114
15	115	115	115	115	115
16	116	116	116	116	116
17	117	117	117	117	117
18	118	118	118	118	118
19	119	119	119	119	119
20	120	120	120	120	120
21	121	121	121	121	121
22	122	122	122	122	122
23	123	123	123	123	123
24	124	124	124	124	124
25	125	125	125	125	125
26	126	126	126	126	126
27	127	127	127	127	127
28	128	128	128	128	128
29	129	129	129	129	129
30	130	130	130	130	130
31	131	131	131	131	131
32	132	132	132	132	132
33	133	133	133	133	133
34	134	134	134	134	134
35	135	135	135	135	135
36	136	136	136	136	136
37	137	137	137	137	137
38	138	138	138	138	138
39	139	139	139	139	139
40	140	140	140	140	140
41	141	141	141	141	141
42	142	142	142	142	142
43	143	143	143	143	143
44	144	144	144	144	144
45	145	145	145	145	145
46	146	146	146	146	146
47	147	147	147	147	147
48	148	148	148	148	148
49	149	149	149	149	149
50	150	150	150	150	150
51	151	151	151	151	151
52	152	152	152	152	152
53	153	153	153	153	153
54	154	154	154	154	154
55	155	155	155	155	155
56	156	156	156	156	156
57	157	157	157	157	157
58	158	158	158	158	158
59	159	159	159	159	159
60	160	160	160	160	160
61	161	161	161	161	161
62	162	162	162	162	162
63	163	163	163	163	163
64	164	164	164	164	164
65	165	165	165	165	165
66	166	166	166	166	166
67	167	167	167	167	167
68	168	168	168	168	168
69	169	169	169	169	169
70	170	170	170	170	170
71	171	171	171	171	171
72	172	172	172	172	172
73	173	173	173	173	173
74	174	174	174	174	174
75	175	175	175	175	175
76	176	176	176	176	176
77	177	177	177	177	177
78	178	178	178	178	178
79	179	179	179	179	179
80	180	180	180	180	180
81	181	181	181	181	181
82	182	182	182	182	182
83	183	183	183	183	183
84	184	184	184	184	184
85	185	185	185	185	185
86	186	186	186	186	186
87	187	187	187	187	187
88	188	188	188	188	188
89	189	189	189	189	189
90	190	190	190	190	190
91	191	191	191	191	191
92	192	192	192	192	192
93	193	193	193	193	193
94	194	194	194	194	194
95	195	195	195	195	195
96	196	196	196	196	196
97	197	197	197	197	197
98	198	198	198	198	198
99	199	199	199	199	199
100	200	200	200	200	200

The Ad-Ready set of plan sheets shall be on 11 inch by 17 inch paper

If contract plans have more than _____ sheets or contract provisions have more than _____ pages, they will have to be separated into multiple volumes.

Certification of Documents by Licensed Professionals

WSDOT plans and specifications shall be certified with:

No certification is required on Index, Vicinity Map, Summary of Quantities, Quantity Tabulations, Bar Lists, Temporary Erosion Site Control Plans or Traffic Control Plans.



<http://wwwi.wsdot.wa.gov/docs/OperatingRulesProcedures/1010.pdf>

Some plan sheets require a second stamp & live signature. This occurs most often in Bridge & Structures. The title block allows for that, and provides the space necessary for stamps that have been digitally scanned to be placed in the title block.

Standards and Symbols

State Cell Library

In the past there were several elements on one level. Now each element has its own level.

Light Std Dbl Timber*

Parent Group: TR

(TR_IL_LightStdDblTimber)

Child Group: IL

Sized for a 50 scale drawing.

Element Name: LightStdDblTimber

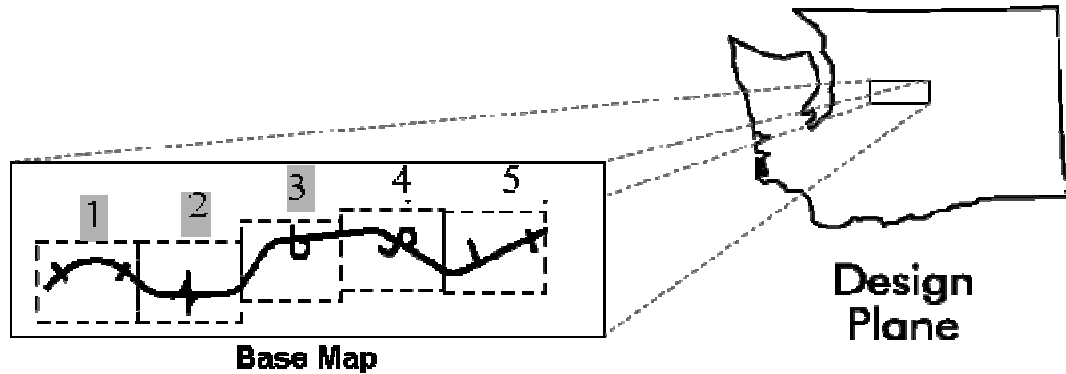
[illegible]

When the same work is specified and represented in the plans the same way, the contractors know exactly what will be required and what will be acceptable.

The image shows the front cover of a report. At the top, the text "WSDOT" is centered in a large, bold, black, sans-serif font. Below this is a black and white aerial photograph of a large, rectangular, multi-lane highway interchange or interchange under construction, surrounded by trees and hills. Below the photograph, the title "Electronic Engineering Data Standards" is centered in a large, bold, black, sans-serif font. Underneath the title, the date "July 2006" is centered in a smaller, black, sans-serif font. At the bottom right of the cover is the Washington State Department of Transportation logo, which consists of a stylized circular emblem with a bridge-like shape inside, followed by the text "Washington State Department of Transportation" in a black, sans-serif font.

The instructions in this manual are not intended to preclude judgment of the project manager in the event of special or unique circumstances that would make following these standards less efficient for delivery of a specific project. This manual will be updated on a continuing basis, with revisions issued periodically. The current version will be available electronically on the WSDOT CAE web site. Suggestions for improvements are welcome. Please send any comments or suggestions to your local WSDOT CAE Coordinator.

Base Maps



Created via CADD in MicroStation, Base Maps are:

- ✓ Coordinate-based
- ✓ Represents actual location(s) on Earth's surface
- ✓ Existing and new features

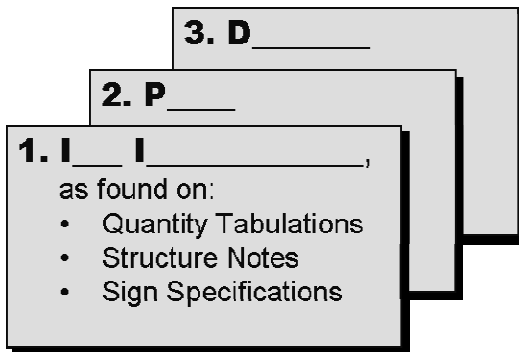
As a designer you need to determine how you are going to manage the Base Map for your project. You need to make decisions based on a number of things.

- ✓ What is the scale of the plan sheets?
- ✓ How many base maps?
- ✓ Who is the lead CADD Drafter/ lead Designer?
- ✓ Base Map access/ Communication Plan?
- ✓ Documentation?

Plan Sequence

The sequence indicated in PPM 400.06 is the order you would need to use if all the various plan sheets were included in your project.

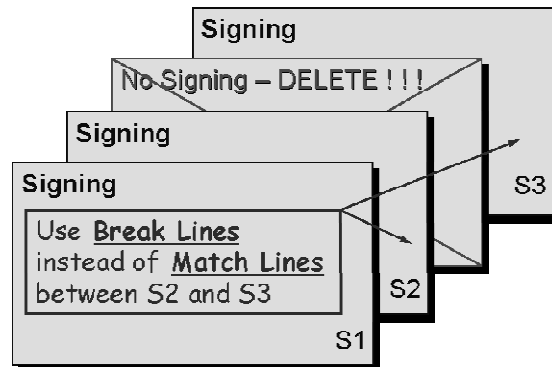
Basic Order within a Plan Series



1. I ____ I ____ (quantity tabulation/structure notes /sign specifications)
2. P ____ series (the series showing the items of work described on the quantity tabulation/ structure notes /sign specifications sheets)
3. D ____ (for work associated with items shown on the plan sheets)

Do not include sheets in a series that do not contain information relevant to the series.

Eliminate “Blank” Sheets Within a Plan Series



The designer is to take every opportunity to reduce the volume of the plans by using logical combinations of plan series to best display the information. Because there are no two projects exactly the same, the designer needs to examine the logical combinations of plan series for each project.

Displaying too much information may cause confusion to the contractor bidding the project and often results in higher bid prices. Just as a series of plan sheets with minimal information displayed on each sheet makes it difficult to see the relationship of different items of work, which also equates to dollars for contractors trying to bid the project.

If the information does not add value to the plan sheet, **DON'T** show it.

Index

An index is required for all projects with _____ plan sheets or more. On smaller projects the Index and Vicinity Map may be combined.

Index Titles shall match Sheet Titles exactly

SHEET NO.	PLAN REFERENCE NO.	TITLE
1	IN1	INDEX
2	V1	VICINITY MAP
3	SD1	SUMMARY OF QUANTITIES
4	CR1	CONTRACT DECLARATION
5-6	R1-R2	ROADWAY SECTIONS
7		
8-12		
13-17		
18-22		
23		
24-28		
29-32		

SUMMARY OF QUANTITIES		SQ1
		SHEET 3 OF
		SHEETS

A project with more than one of plan sheets shall have a complete project index, providing information on all volumes, in each volume.

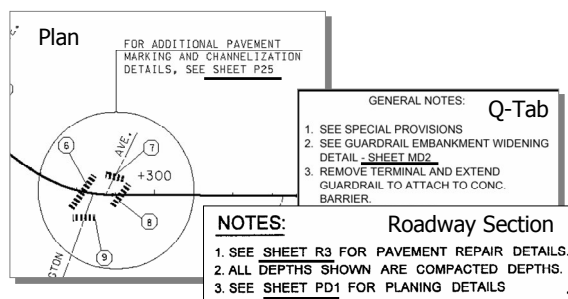
See the examples of plan sheet reference numbers.

SHEET NO.	PLAN REFERENCE NO.	TITLE
1	IN1	INDEX
2	V1	VICINITY MAP
3	SD1	SUMMARY OF QUANTITIES
4	CR1	CONTRACT DECLARATION
5-6	R1-R2	ROADWAY SECTIONS
7	GI	GRADING DETAILS
8-12	A1-A5	ALIGNMENT / RIGHT OF WAY PLAN

ROADWAY SECTIONS		R1
		SHEET 5 OF
		SHEETS

Use Plan Reference Numbers for cross-referencing between plan sheets

Plan Reference Numbers



Since actual sheet frequently get revised as sheets are added, deleted or moved around, you are strongly encouraged to use plan sheet reference numbers, to assist you in cross referencing between various plans.

Plan Sheet Reference Numbers

Regardless of the size of a project, plan reference numbers should be used on all projects in lieu of plan sheet numbers. Advantages include of this system include: 1) The total number of plan sheets doesn't have to be known, 2) Once a reference number has been assigned, these numbers will never change and, 3) Plan sheets can be inserted or deleted within the series without re-sequencing or renumbering the remaining plan sheets in that series.

In the past, each region developed their own reference standards. However with the publication of the Electronic Engineering Data Standards in July 2006, statewide standards were established. Those standards are included below as a guide.

It is recommended that you keep alpha characters to no more than 2. The box the plan sheet reference number goes in is pretty small & the page number has to go in after the alpha characters (i.e. DP-1). As many times more than 9 sheets are required in a plan series, this means 4 characters in the small box, with only 2 alpha characters. The more characters included, the smaller the font size to fit them in.

4.3.2 Plan Type Codes

AL	Alignment	PV	Paving Plans
AP	Approval Plan	RC	Reclamation, Borrow, Pit, Quarry, Etc.
BG	Bridges	RD	Roadway
BU	Building Plans and Details	RM	Record of Monumentation
CN	Contours	RS	Roadway Sections
CT	Control for Survey	RV	Record of Survey
DR	Drainage	RW	Right of Way
DU	Detour Routes and Signing	SU	Staged Construction
EC	TESC	SG	Signals
EL	Electrical	SN	Signing
EM	Environmental Compliance	SP	Site Preparation
EU	Existing Utilities	SQ	Summary of Quantities
EX	Existing	SS	Signing Specifications
GS	Grading Sections	ST	Structures/Minor Structures
IC	Interchange Contour	TC	Traffic Control Plans
IL	Illumination	TS	Traffic Systems
IN	Index	UT	Utilities
IR	Irrigation	VM	Vicinity Map
LS	Landscape	WA	Walls
MK	Pavement Markings		

For large projects, Quantity Tabulations may be placed immediately prior to the plan sheets showing the work that is tabulated on the quantity tabulation sheet, such as those for traffic items, site preparation, guardrail items, etc.

Index Exercise

Instructions

Each team will be given 32 assorted plan sheets. Each team should:

1. Assemble them into the proper order using the PPM section 400.06 as a guide.
2. Fill out the index on the next page.
3. Identify any plan series that exist in the plans set and which entities contributed to the plans.

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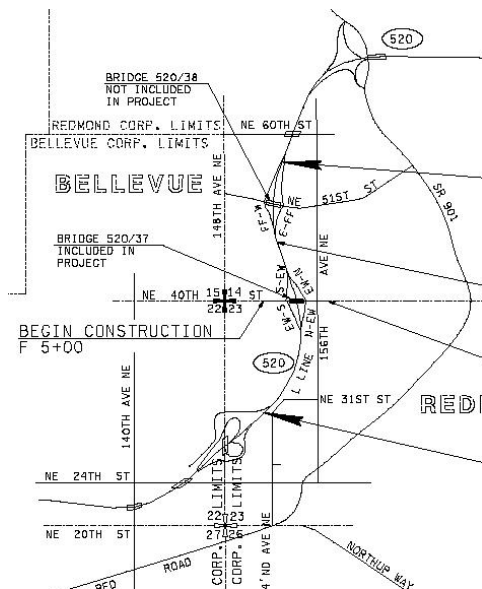
Project Office Plans

What is it that I need to do?

There is a variety of plans that a designer may need to create for their project. The designer is to take every opportunity to reduce the volume of the plans by using logical combinations of plan series to best display the information.

Because no two projects are exactly the same, the designer needs to examine these combinations of plan series for each project, remembering that if the information does not add value to the project then don't show it.

Vicinity Map



A Vicinity Map is required on all projects. It is typically derived from State Quad Maps and the scale is adjusted to fit the project size. The vicinity map can also be used for various other submittals besides PS&E.

Items that need to be shown and labeled on Vicinity Maps include:

- ✓ Cadastral Information
- ✓ Construction centerlines, Detours, Bridges (included or Not Included)
- ✓ Begin/End of Project, Begin/End Federal Aid
- ✓ Distance to nearest city or town in miles
- ✓ Begin/End Construction

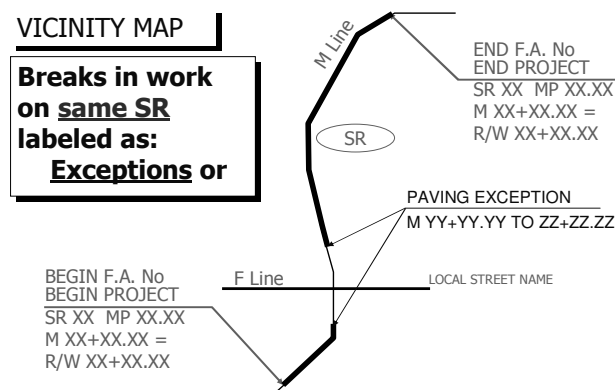
- ✓ Equations
- ✓ Material, Waste, Stockpile & Pit Sites
- ✓ Haul Routes
- ✓ Railroads lines, Ownership & crossing ID number
- ✓ Waterways & streams
- ✓ Wetland & Wetland Mitigation Sites

There are two ways to show breaks in the area where work is being performed.

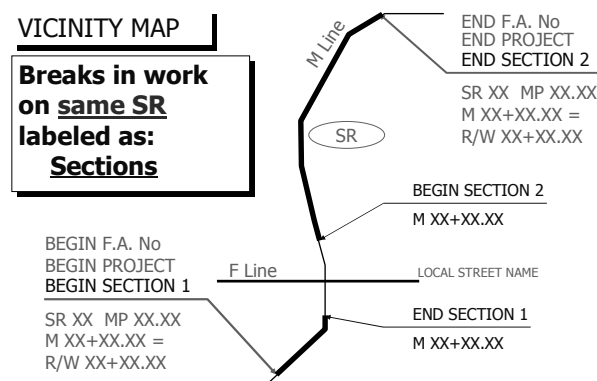
Don't mix the two different ways. Label consistently throughout the plans.

Exceptions & Sections

If the entire project is for one SR (State Route), but has breaks in the areas where work is to be performed from the Beginning of Project to the End of Project, these breaks should be labeled as “exceptions” or “exception areas”.



If there are numerous exceptions or exception areas, an alternate method of showing these exceptions to label the areas where work is to be performed by Sections.



Vicinity Map Exercise

Instructions

Use PPM 400.06(4) and the various plan examples in PPM Section 4 to assist you in preparing a Vicinity Map.

Given:

The project is located on SR 508. Portions of an USGS quad map have been provided.

- Beginning of Project - MP 2.43 (Sta. 83+44)
- End of Project – MP 8.06 (Sta. 381+51)

No work from:

- MP 4.93 (Sta. 215+15) to MP 5.48 (Sta. 244+58)
- MP 7.05 (Sta. 328+07) to MP 7.36 (Sta. 343+13)

From the Resurfacing Report

The bridge crossing the South Fork of the Newaukum River is not included in the project.

The bridge crossing Gheer Creek is included in the project.

From the State Route Log

Morton is the next town located along SR 508 at MP 32.84

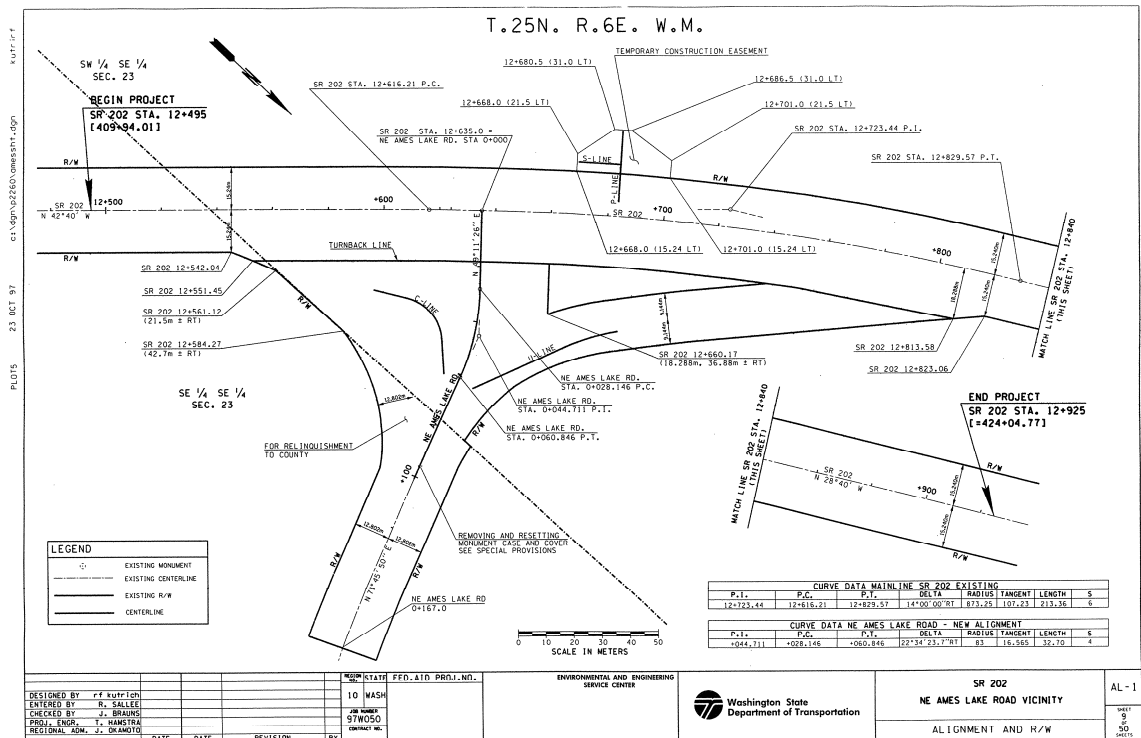
The I-5/SR 508 interchange is located at MP 71.51 on I-5

Chehalis is at MP 76.04 along I-5

Kelso is at MP 41.21 along I-5

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Alignment



The alignment and right of way information will appear on the same series of plan sheets for most projects. Right of way is required to be shown for projects having work outside of the

or

Stationing & Mileposts

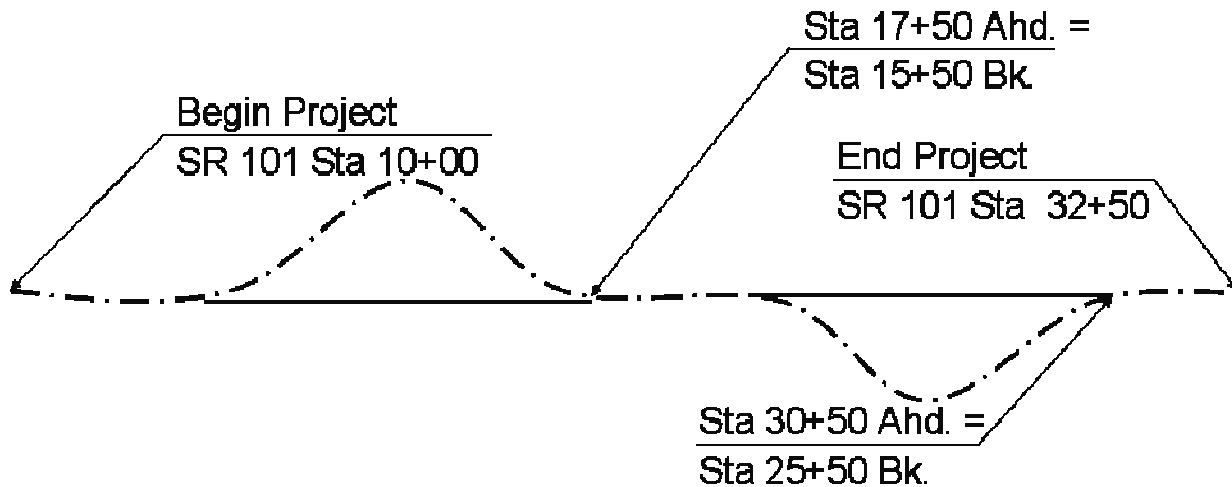
Stationing is a method of measurement typically used by surveyors and engineers during roadway design and construction. The Civil Engineering convention is to define the even 100 units as a station and to write the numerical value with an embedded plus. If the measuring starts at 0+00 at the start of the linear element, the event occurs at 132+00, i.e., 13,200 feet (2.5 miles) along the linear element.

Mileposts are located at one mile increments along the highway. Milepost 2 is 2.0 miles from the start of the highway.

Equations

Reconstruction can alter the alignment of a roadway, thereby impacting the length of the roadway. When this happens equations are used.

Try to avoid equations whenever possible by using construction stationing. The use of construction stationing will eliminate any duplicate stationing on the project.



Linear equations should not be an issue if the designer establishes construction stationing for the project, instead of using right of way stationing. If linear equations are present, the designer must make sure that they are “gap” equations and not “overlap” equations.

Overlap equations cause confusion because of the duplication of stationing caused by the overlap. To convert an overlap equation to a gap equation, a 1 can be added in front of the Ahead station (5+00 would become 15+00), or by adding 1 to the first digit of the Ahead station (110+00 would become 210+00).

Examples:

Overlap equation 10+00 BK = 5+00 AHD

Adding a 1 in front of the Ahead station would change the equation to a
Gap equation of 10+00 BK = 15+00 AHD

Overlap equation 150+00 BK = 110+00 AHD

Adding a 1 to the first digit of the Ahead station would change the equation to a
Gap equation of 150+00 BK = 210+00 AHD

Right of Way

Right of way center line and Right of way lines without exception will always be solid lines on the contract plans. The following information would also normally appear on Alignment/Right of Way plan sheets:

- ✓ Identify Construction Permits, Easements (type and use)
- ✓ Tie to centerline by Station and Offset
- ✓ Limited access hachures
- ✓ Found section corners and monuments
- ✓ Station and offset ties to railroads and railroad rights of way that intersect the project or are affected by the project.
- ✓ Corporate limit and county lines with station identification where they cross the construction centerline.
- ✓ Names of rivers, streams, bays, and inlets.
- ✓ Slope catch lines (cut & fill) shall be shown.
- ✓ The outline of sand drainage blankets, unsuitable foundation excavation, and toxic waste excavation areas.

Coincidental **R/W and CN center lines:**

- 1) At the **Beginning and End of the Project**

BEGIN PROJECT

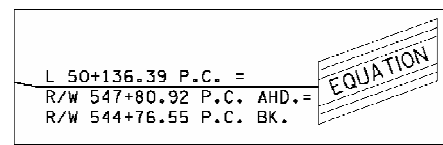
SR XX MP XX.XX
M XX+XX.XX =
R/W XX+XX.XX

Another type of equation is when there is more than one alignment. The equation identifies the _____ between the alignments.

Coincidental **R/W and CN center lines:**

- 2) At each **CN center line station**
corresponding to a **R/W equation**

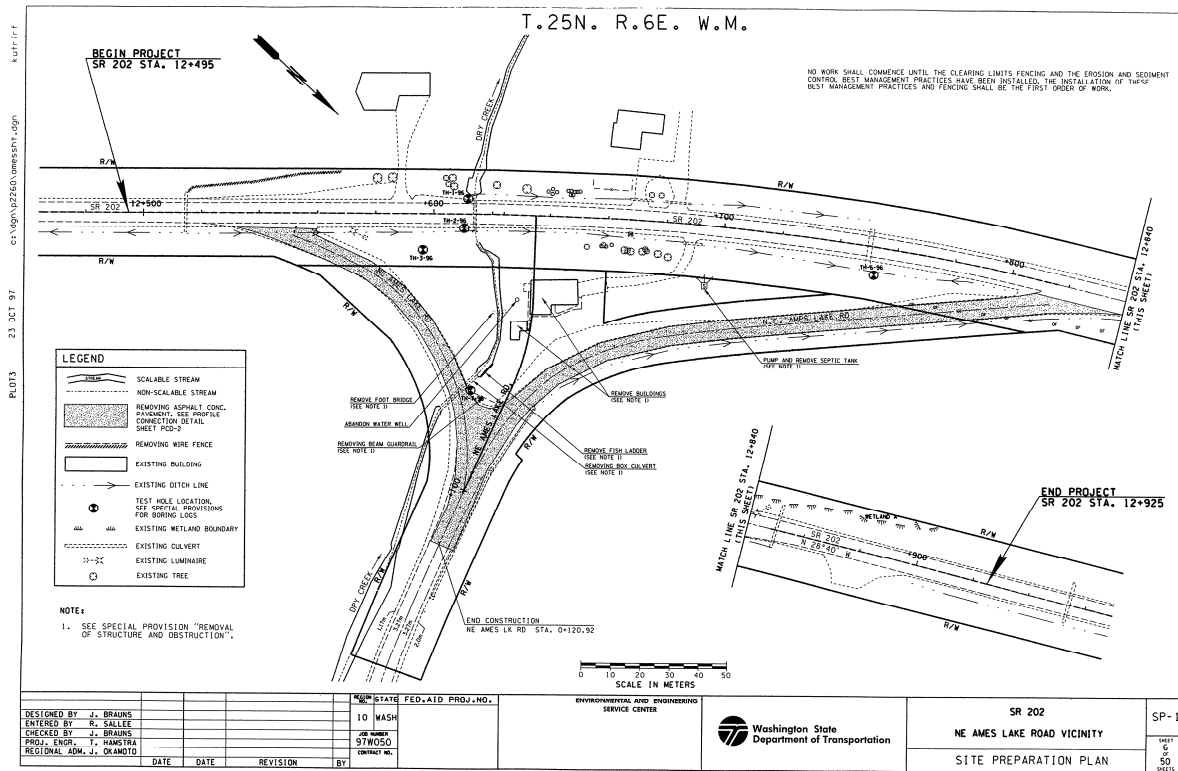
When there is more than one alignment and there is an equation in only one of them, an equation is used to show their relationship at that location.



When the right of way centerline is not coincidental with the construction centerline, they don't share the same alignment. The offset distance between the right of way and construction centerlines shall be shown at the begin and end of project. In addition to the equations at the begin and end of project, equations shall be shown at all points where the right of way and construction center lines cross and at the location of right of way plan equations.

Site Preparation Plans

The site preparation series of plans is where all existing topography within your project limits is to be shown, as well as any removal and/or demolition work involved with your project.



Typical items paid by unit price shown on the Site Preparation Plan:

- Guardrail
- Fencing
- Drainage Items
- Sidewalk
- Curb
- Pavement Marking

If there is very little topography to be shown and very little removal and demolition work to be performed, this information can be shown on the Alignment/Right of Way plan series as long as it does not compromise the information required on the Alignment/Right of Way plans.

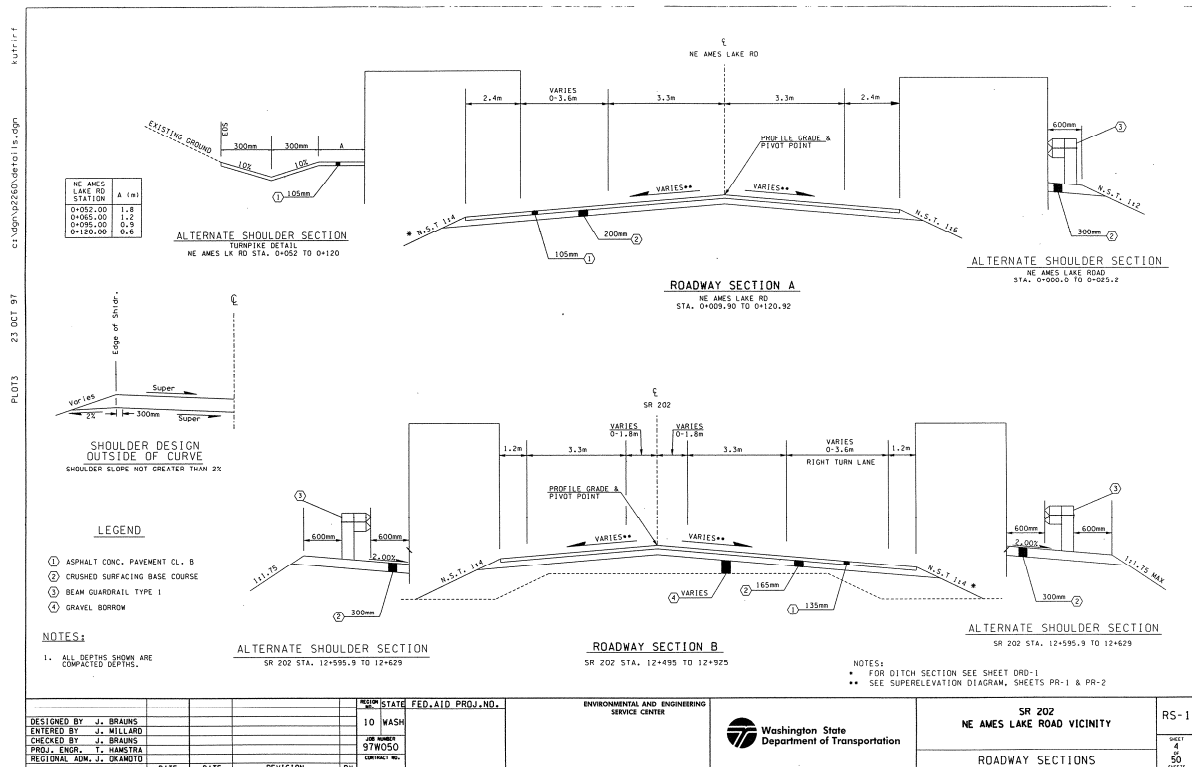
Roadway Sections

Cover entire length of project

- ✓ No gaps → ID exceptions & equations
- ✓ No overlaps

Shall be consistent with the Paving Plans and Roadway Profiles

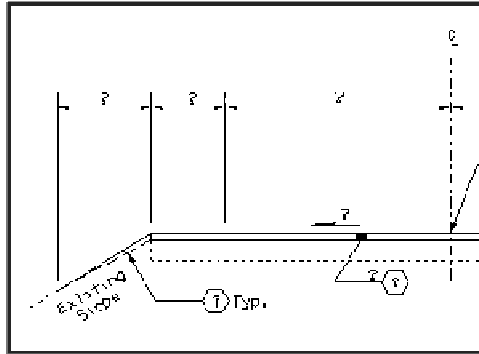
Provide complete cross section geometry from subgrade up showing every combination of Surfacing materials and depths.



Roadway sections are to provide complete geometric information on the roadway cross section from the subgrade up and general information left and right of centerline. The information on the roadway sections will tie directly to the paving plans and the profiles, if these series of plans are included in the project.

Roadway sections are to represent conditions from the subgrade up for the entire length of the construction line(s) (mainline, ramps, detours, frontage roads, road approaches, city streets, etc.) included in your project.

There is no scale on roadway sections so you need to draw the features proportionally.

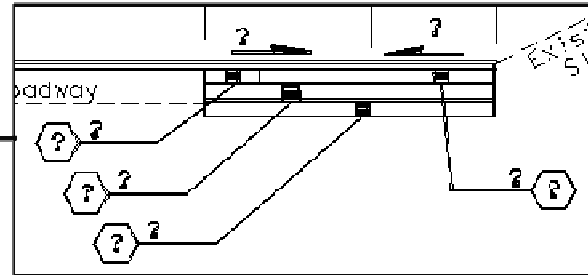


Pavement widths

12 ft lane vs. 4 ft shoulder

Material depths

0.15 ft HMA vs. 0.60 ft CSBC



Variable dimensions (Example: Varies 2' to 10') may be used to represent differences in shoulder or lane widths, or transition areas, as long as there is a paving plan that clearly shows, by stationing, the actual widths desired.

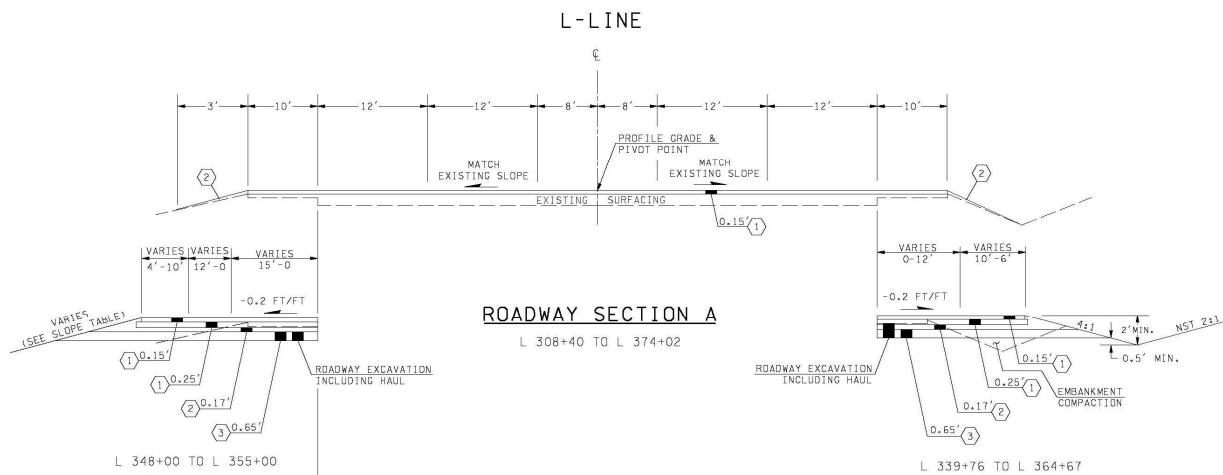
If the project is a pavement overlay project and no paving plan is going to be provided, the use of variable horizontal dimensions is discouraged, unless construction notes are used to describe, by stationing, where the variable paving widths or transitions begin and end.

There are three basic ways to show variable dimensions:

1. _____
2. _____
3. _____

A generic roadway section for bridges must be provided to avoid having gaps in stationing. If the bridge is being overlaid, additional detail will be required. When a project has a structure on main line or a secondary line, that is not included in the project, a paving exception should be noted on the roadway section sheet.

Use subordinate section to show partial changes in roadway design.



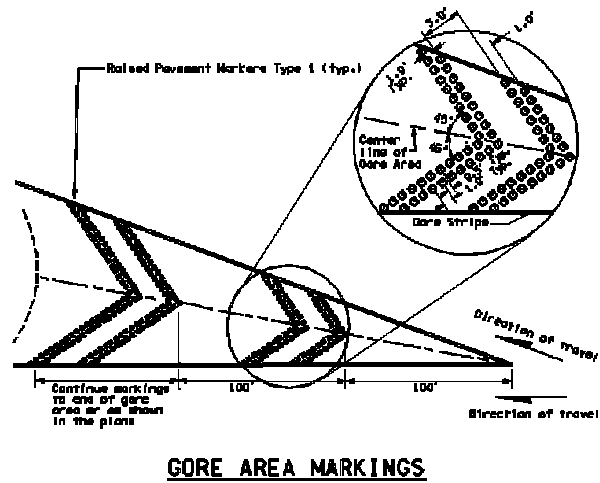
True or False? Subordinate sections can be placed above Roadway Sections.

Each roadway section in the project shall show the following applicable items:

- ✓ Horizontal dimensions of the roadways, as approved in the Design Decision Summary.
- ✓ Project specific design details and features, such as curbs, sidewalks, riprap, etc.
- ✓ The depths of surfacing and paving.
- ✓ Station to station limits for each line represented by the roadway section.
- ✓ The position of the profile grade, pivot point for super transition, and construction centerline.
- ✓ The depth from profile grade to the roadway surface being constructed, if the project does not include ultimate design surfacing. This depth shall be labeled “Future”.
- ✓ The type, width, and thickness of the existing surface, if the existing surface will affect construction.
- ✓ A general note indicating that all surfacing and paving depths are compacted depths and courses shall not exceed depths defined in the Standard Specifications.
- ✓ The roadway ditch depth shall meet the design criteria as stated in the Design Manual. A slope table should be used when embankment and excavation heights vary enough to require different slope rates. Show side slopes for embankment sections, in-slopes and back slopes for excavation areas.
- ✓ A section showing shoulder widening for guardrail.
- ✓ A surfacing legend is to be shown on each sheet indicating the type of surfacing material, with the exact item name as found on the Summary of Quantities. Each type of material shall be assigned an identifying number enclosed by a hexagon symbol.
- ✓ Construction notes shall be numbered consecutively for the project, but only the construction notes that are applicable to a particular sheet will be shown on the sheet. Continue sequencing of construction notes consecutively as you add them. DO NOT re-sequence from one plan sheet to the next.

Paving Details

Paving or pavement marking details, such as the layout of a traffic island, may be required at a larger scale to provide sufficient information or required dimensioning to clearly show the construction. These details will follow immediately after the paving/pavement marking series of plans.



Roadway Section Exercise

Instructions

Complete the Roadway Section Sheet R1 and Paving Detail Sheet PD1 for Section 1 using the following information and the Plan Preparation Manual 400.06(7).

Given:

Resurfacing Report memo dated September 18, 2006, (recommendations may be found on page 2.

Site Preparation & Alignment Sheets, SP1 & SP2. Longitudinal planing areas coincide with locations of cement concrete curb, gutter and sidewalk. Begin and end planing limits are labeled. Transverse planing length is 50 feet.

Paving Plans will be included in the contract plan set; make reference to them for:

- Variable widths shown in the Section(s).
- Curb to be replaced

Ignore jogs in the pavement; assume geometrics listed below.

Cement Concrete Curb, Gutter & Sidewalk sections:

Traveled way	60 feet
Left Turn Lane	12 feet (6 feet each side of centerline)
Thru Lanes	4 total, 2 each direction @ 12 feet each
Shoulders	3 feet (Edge of traveled way to gutter)

Consider 148th St SW and Shelby Road as part of the cement curb and sidewalk section.

HMA Shoulder sections:

Traveled way	60 feet
Left Turn Lane	12 feet (6 feet each side of centerline)
Thru Lanes	4 total, 2 each direction @ 12 feet each
Shoulders	Varies left and right

Overlay shall match existing cross slopes.

Apply crushed surfacing base course along shoulder sections at 6:1 to eliminate abrupt edge condition the resurfacing would otherwise create.

September 18, 2006

TO: Headquarters' Material Lab

FROM: Regional Materials Lab

SUBJECT: SR 999, 0L-0000
Contract Plan Prep - Roadway Section Exercise
HMA Overlay
MP 50.15 – MP 50.46
PIN 109970P
RESURFACING REPORT

This memo addresses our comments and recommendations for the subject project that lies in southwest Snohomish County.

This project proposes to rehabilitate the highway with HMA overlay, from MP 50.15 to MP 50.46. Crack sealing and other minor items of work are incidental to the overlay.

Existing

This existing portion was originally built with 0.58' PCC over 0.50' UTB in 1927 on an unknown contract. It has since been overlaid as shown on the attached surfacing profile. The highway was asymmetrically widened on unknown contracts.

The highway consists of two 11' to 12' wide lanes in each direction, a 12' shared left turn lane, and eight to 12-foot wide shoulders. Curb and gutter sections are present sporadically throughout the length.

Pavement Cores: (All cores taken @ 3.0' Lt. of fog line, in the widening areas)

MP 50.17 – 0.43' HMA
MP 50.30 – 0.45' HMA
MP 50.44 – 0.46' HMA

Pavement Condition

The roadway is distressed with low to medium severity levels of construction joint, longitudinal, and random cracking in the wheel path. Some medium to high level severity reflective cracking was noted. Wheel path rutting ranges from ¼" to ¾" especially at intersections.

Recommendations

No remedial treatments needed for the section mentioned above.

The preliminary items of work on this project:

Grinding should be performed where necessary to provide vertical butt joints for paving operations.

For curb and gutter sections, a zero to 0.15' deep grinding for longitudinal butt joints at curb lines, should be accomplished where needed; in no less than eight feet.

The existing HMA should be crack sealed where necessary and preleveled with HMA for Preleveling Cl. 3/8" at a rate of 300 tons per lane mile exclusive of the grinding areas.

Followed these items of work, the highway should then be overlaid with 0.15' HMA Cl. 1/2".

FWD data was analyzed and Back Calculation method utilized to arrive at our recommendations.

Other

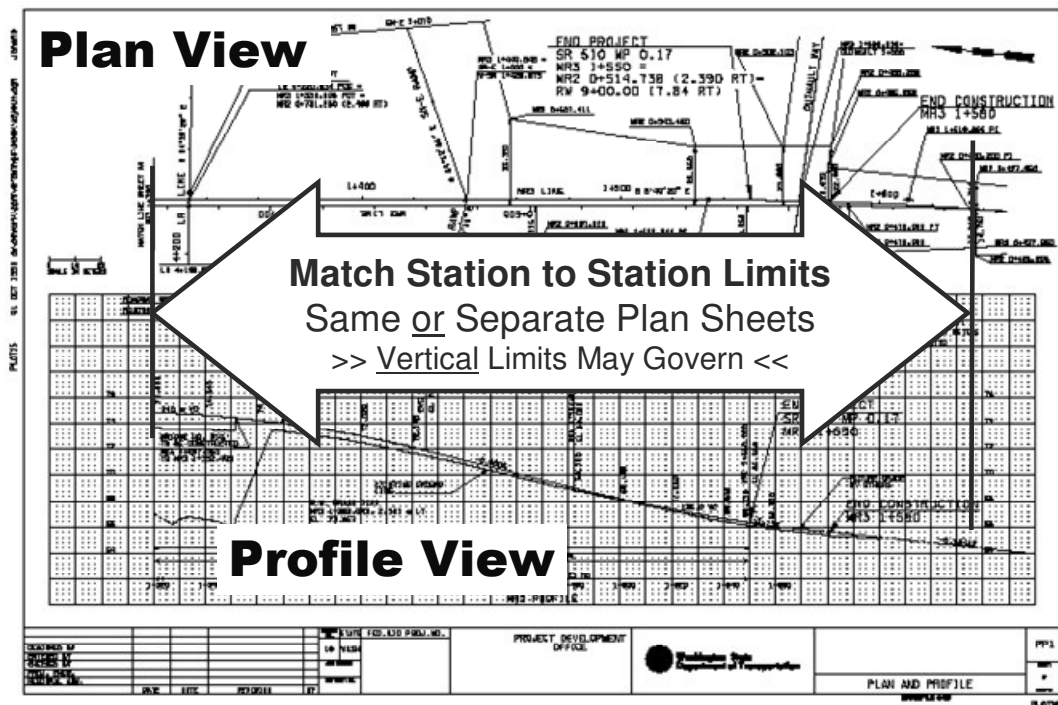
The source of all materials required for use on the project will be provided by the Contractor.

The recommendations contained in this Pavement Rehabilitation Report are based on the physical roadway conditions existing at the time of this report. Several uncontrollable factors, such as increased traffic volumes and loading, severe weather conditions, maintenance operations, and project delays, can invalidate these recommendations. We recommend that the Materials Lab be contacted at the 30% PS&E completion stage so that we can field review this project. We can then verify that our recommendations are still valid.

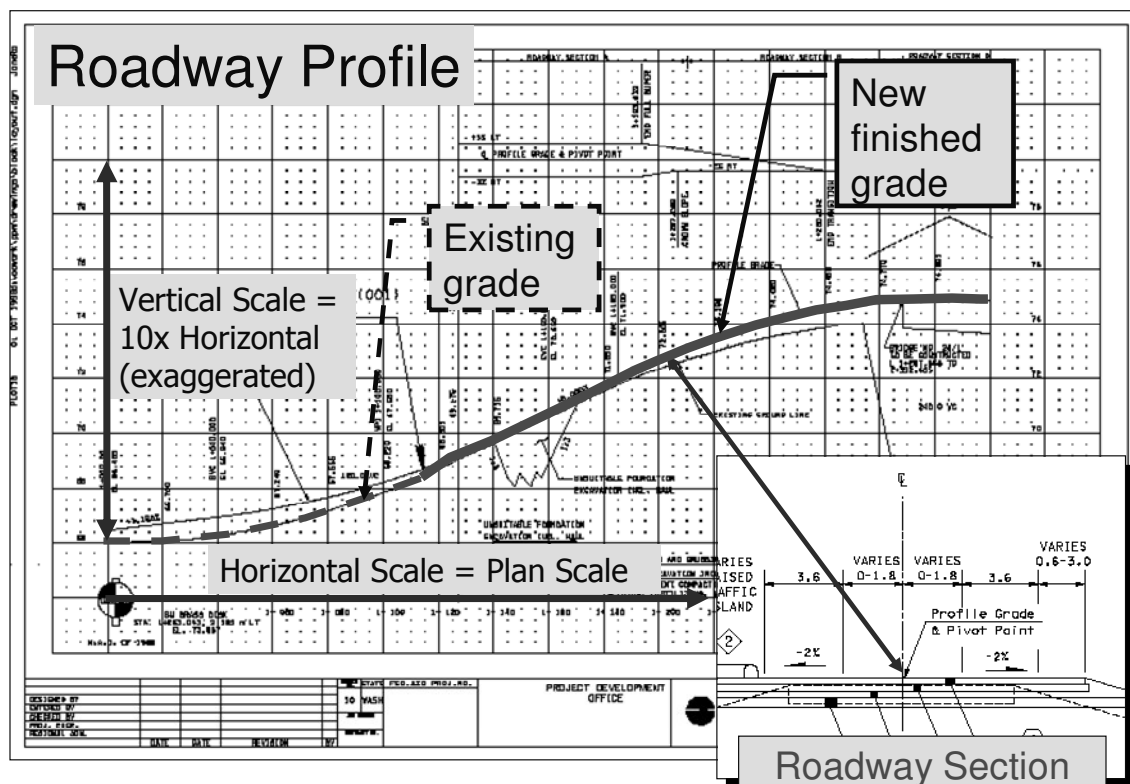
KK:ms

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Roadway Profiles



The station limits on the plans sheets must match the exact station limits on the profile sheets.



The following information is required on profile sheets:

- ✓ The limits of roadway sections will appear with arrows; these are always to be the top most entry on the profile sheets.
- ✓ The existing ground line will be shown as a dashed line.
- ✓ The finished profile grade line will be shown as a heavy solid line.
- ✓ The datum symbol with North American Vertical Datum (NAVD) 88 is to be shown on every roadway profile sheet.
- ✓ Benchmarks information
- ✓ Beginning (BVC) and ending (EVC) station of each vertical curve.
- ✓ The station and elevation of the point of intersection of the gradients (VPI).
- ✓ Gradients between vertical curves.
- ✓ Length of each vertical curve.
- ✓ Elevation and station at each break (angle point; AP) in gradient with elevation shown to 0.01 foot.
- ✓ Elevation at beginning and ending station of each vertical curve.
- ✓ Superelevation diagrams.
- ✓ Areas of work or quantities will be shown, with arrows, between the station-to-station limits of the work, or at 10 station (1000') totals or at other logical breaks, such as bridges or group breaks.
- ✓ Quantities to be shown will be roadway excavation, controlled blasting, vertical sand drains, unsuitable foundation excavation, toxic waste excavation, embankment compaction, special backfill, clearing and grubbing, seeding, compost, topsoil and fertilizing and mulching.
- ✓ The use of the term “embankment” by itself is permitted only when Method A compaction is specified. It must be noted that “embankment” quantities are shown for informational purposes only.
- ✓ The bottom of unsuitable foundation excavation and toxic waste excavation will be shown, but should be shown as a squiggly line to indicate that the actual bottom elevation of the excavation is unknown.

Roadway Profile Exercise

Instructions

Use PPM 400.06(12) and example 4-20 in PPM Section 4 to assist you in preparing the following Profile and Superelevation Sheet.

Given:

Roadway Sections & various CAiCE reports

```

                                     AR Ramp Profile
AR3 : Alignment Station Map
Station Back   Station Ahead
100+00.00
113+97.02      113+97.02

CAiCE Visual Roads Design System
Profile Report

Profile Name : PVAR3               Tue May 01 10:15:46 2007
Description  : MODIFIED FOR TDI
```

```

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-----
      K-VALUE      STATION  ELEVATION      GRADE      TOTAL      BACK      AHEAD
                        PERCENT      VC LEN      VC LEN      VC LEN
BEG AT    1    100+00.00    214.25
BVC        102+70.00    213.00    -0.4614
VPI AT    2    105+70.00    211.62      600.000    300.000    300.000
      166.349388
EVC        108+70.00    221.05      3.1420
BVC        108+70.00    221.05      3.1420
VPI AT    3    110+70.00    227.33      400.000    200.000    200.000
      351.172258
EVC        112+70.00    231.34      2.0029
END AT    4    113+97.02    233.88
-----
-----

End of Report Profile.
```

AR Ramp Supers

CAiCE Visual Roads SuperElevation Report

Project Name = C:\AAWORK\PROJECTS\LBINT\LBINT

Horizontal Alignment = AR3

Design Speed = 0.000000

Normal Crown SuperElevation Rate = 0.020000

Shoulder Normal Crown SuperElevation Rate = 0.020000

Percent Tangent = 70.00 Percent Curve = 30.00

Left Offset = 32.000000 Right Offset = 15.000000

Design Tables : SuperElevation = C:\CAE_RSC\CAICE_PE\SUPER\ENGLISH\S10E.TBL

RunOff = C:\CAE_RSC\CAICE_PE\SUPER\ENGLISH\R32S10E.TBL

SuperElevation Transition Points :

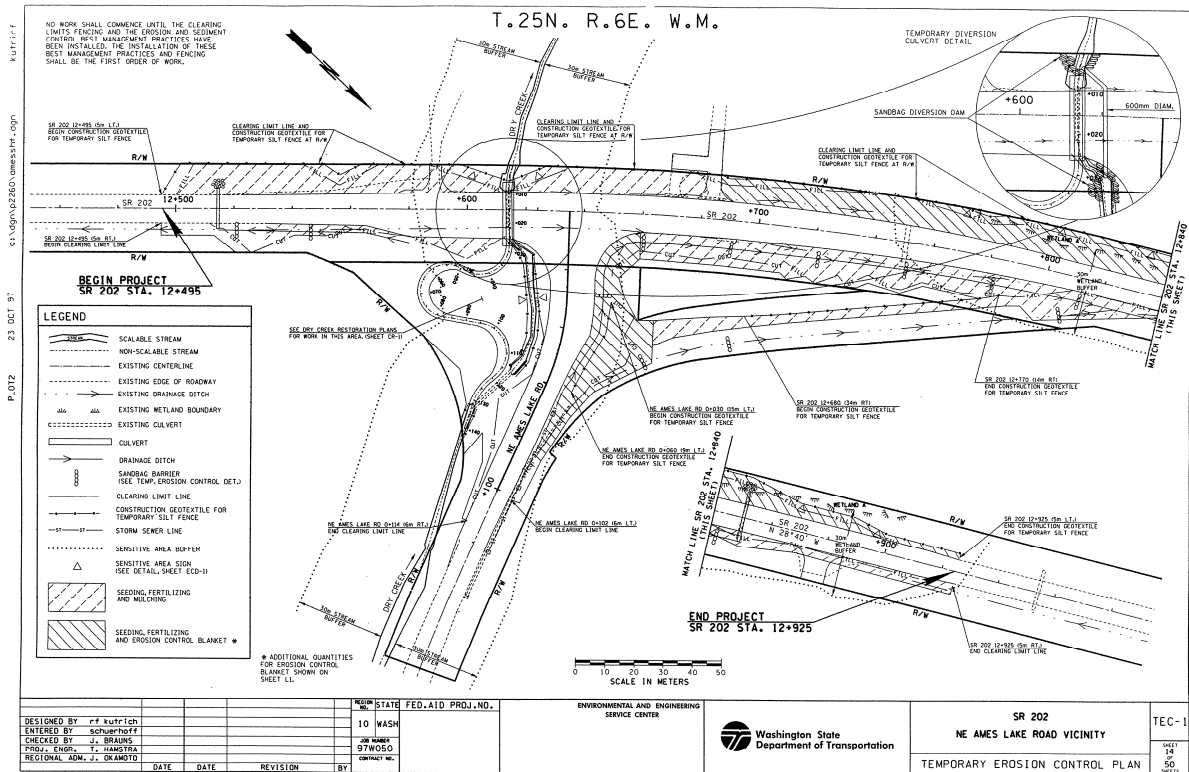
Station	Type	Left	Right	ShoulderLeft
ShoulderRight				
100+00.00		0.020000	-0.020000	0.020000
-0.020000				
103+18.00	Beg Transition	0.020000	-0.020000	0.020000
-0.020000				
104+88.00	Beg Full Super	-0.040000	0.040000	-0.040000
0.040000				
105+71.00	End Full Super	-0.040000	0.040000	-0.040000
0.040000				
107+41.00	End Transition	0.020000	-0.020000	0.020000
-0.020000				
113+54.00		0.020000	-0.020000	0.020000
-0.020000				

End SuperElevation Report

Temporary Erosion Control Plans

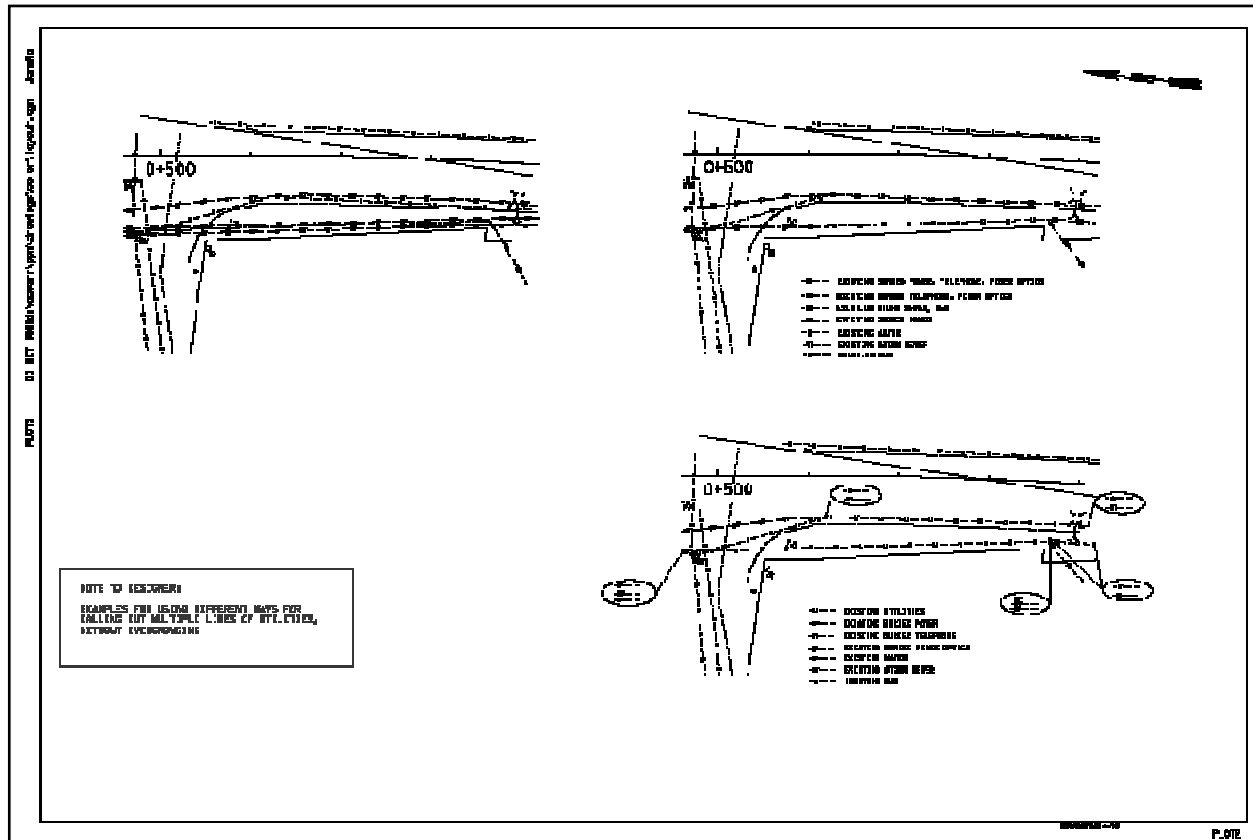
As with Temporary Traffic Control, most contracts these days include provisions for controlling water and erosion during construction. Depending on the complexity of the work, TESC (Temporary Erosion & Sediment Control) features may be combined with another series, such as Site Preparation.

- ✓ Most contracts require this series
- ✓ Combine with Site Preparation
- ✓ Match environmental stipulations in Contract Provisions & Standard Specifications



Utility Plans

When the contractor is to work on the existing utilities as part of the contract, plan sheets for utility structure notes, plans and details will be required. These sheets shall follow the same general guidelines as specified for drainage structure notes, plans, and details.



RCW 19.122.040 requires WSDOT to identify and locate known underground utilities in our contracts. The designer should make every effort to identify and locate above ground utilities also. Do not forget to include WSDOT utilities, such as traffic signal, illumination, and ITS conduits and fixtures.

Stage Construction Plans

Primarily for complex projects. Visualization of phased progress helps designers identify interim improvement needs for:

- Temporary Roadways & Temporary Bridges
- Temporary Signals
- Temporary Illumination

Evaluate traffic control strategy—detours, etc.

Traffic Control Plans

GENERAL NOTES:

- ON-SITE TRAFFIC CONTROL PLAN
- TRAFFIC CONTROL PLAN MUST BE SUBMITTED TO THE PROJECT DEVELOPMENT OFFICE FOR REVIEW
- TRAFFIC CONTROL PLAN MUST BE SUBMITTED TO THE PROJECT DEVELOPMENT OFFICE FOR REVIEW
- TRAFFIC CONTROL PLAN MUST BE SUBMITTED TO THE PROJECT DEVELOPMENT OFFICE FOR REVIEW
- TRAFFIC CONTROL PLAN MUST BE SUBMITTED TO THE PROJECT DEVELOPMENT OFFICE FOR REVIEW

MINIMUM TAPER LENGTH - L (Contractor)

POSTED SPEED (mph)	25	30	35	40	45	50	55	60	65	70
25	25	40	50	60	70	80	90	100	110	120
30	30	45	55	65	75	85	95	105	115	125
35	35	50	60	70	80	90	100	110	120	130
40	40	55	65	75	85	95	105	115	125	135
45	45	60	70	80	90	100	110	120	130	140
50	50	65	75	85	95	105	115	125	135	145
55	55	70	80	90	100	110	120	130	140	150
60	60	75	85	95	105	115	125	135	145	155
65	65	80	90	100	110	120	130	140	150	160
70	70	85	95	105	115	125	135	145	155	165

MINIMUM TAPER LENGTH - L (Contractor)

POSTED SPEED (mph)	25	30	35	40	45	50	55	60	65	70
25	25	40	50	60	70	80	90	100	110	120
30	30	45	55	65	75	85	95	105	115	125
35	35	50	60	70	80	90	100	110	120	130
40	40	55	65	75	85	95	105	115	125	135
45	45	60	70	80	90	100	110	120	130	140
50	50	65	75	85	95	105	115	125	135	145
55	55	70	80	90	100	110	120	130	140	150
60	60	75	85	95	105	115	125	135	145	155
65	65	80	90	100	110	120	130	140	150	160
70	70	85	95	105	115	125	135	145	155	165

LEGEND

- TRAFFIC SAFETY DRUMS
- SEQUENTIAL ARROW SIGN
- TRUCK WITH TMA
- WORK AREA
- CONSTRUCTION SIGN

It is important for the designer of the traffic control plans to remember that when the contractor uses the traffic control layouts shown in the plans, WSDOT is in a high liability position should anything go wrong when the traffic control called for is in place.

Because of the high liability, this portion of these plans needs to be developed with a great deal of thought, by someone with an understanding of the project, in addition to an understanding of traffic control requirements.

Traffic control quantities do not need to be tabulated (see PPM 460.04).

LEGEND

TRAFFIC SAFETY DRUMS

<<<

SEQUENTIAL ARROW SIGN

3

TRUCK WITH TMA

WORK AREA

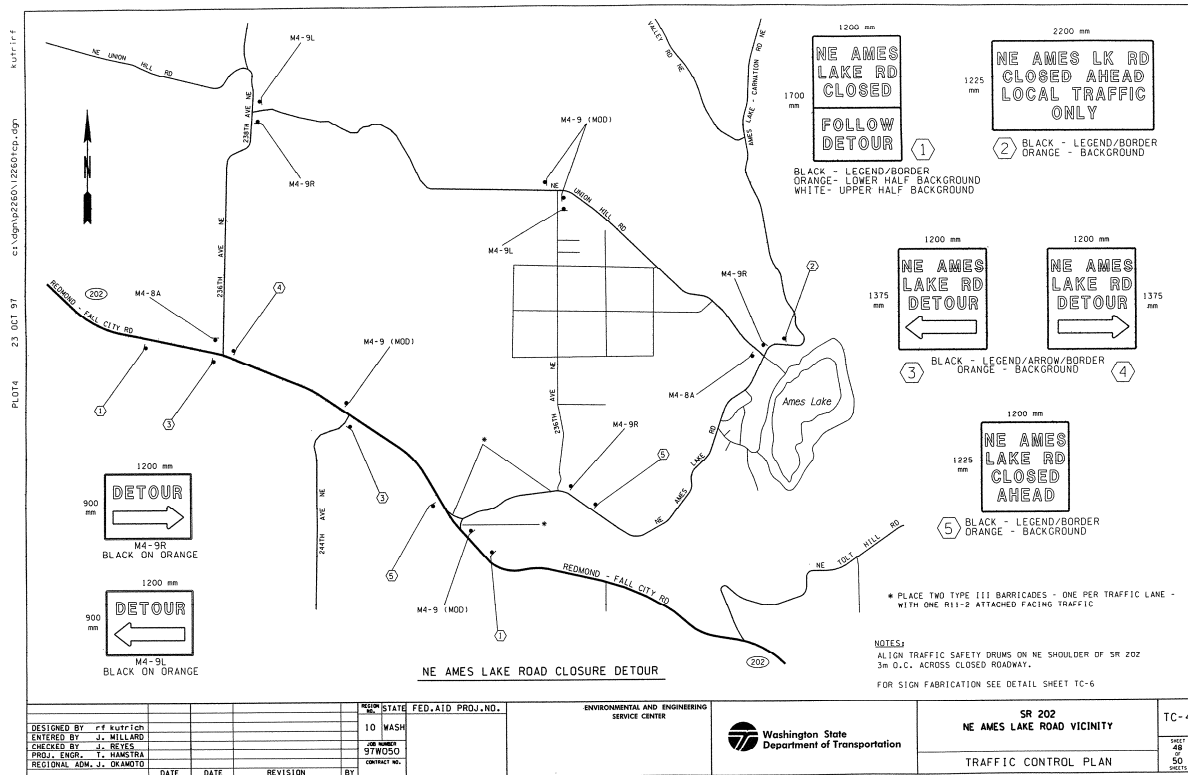
CONSTRUCTION SIGN

Even though quantities don't need to be tabulated. Some offices do tabulate them for backup.

- Sequential Arrow Sign
- Piloted Traffic Control
- Class A Signs
- TC Supervisor
- TC Vehicle

When the traffic control plans are prepared by the Traffic Office, the designer must work closely with the Traffic Office to ensure that the traffic control plans are compatible with the rest of the project and project staging. The Traffic Office, in many cases, is not as familiar with the entire project as the designer, so the designer should review the traffic control plans thoroughly.

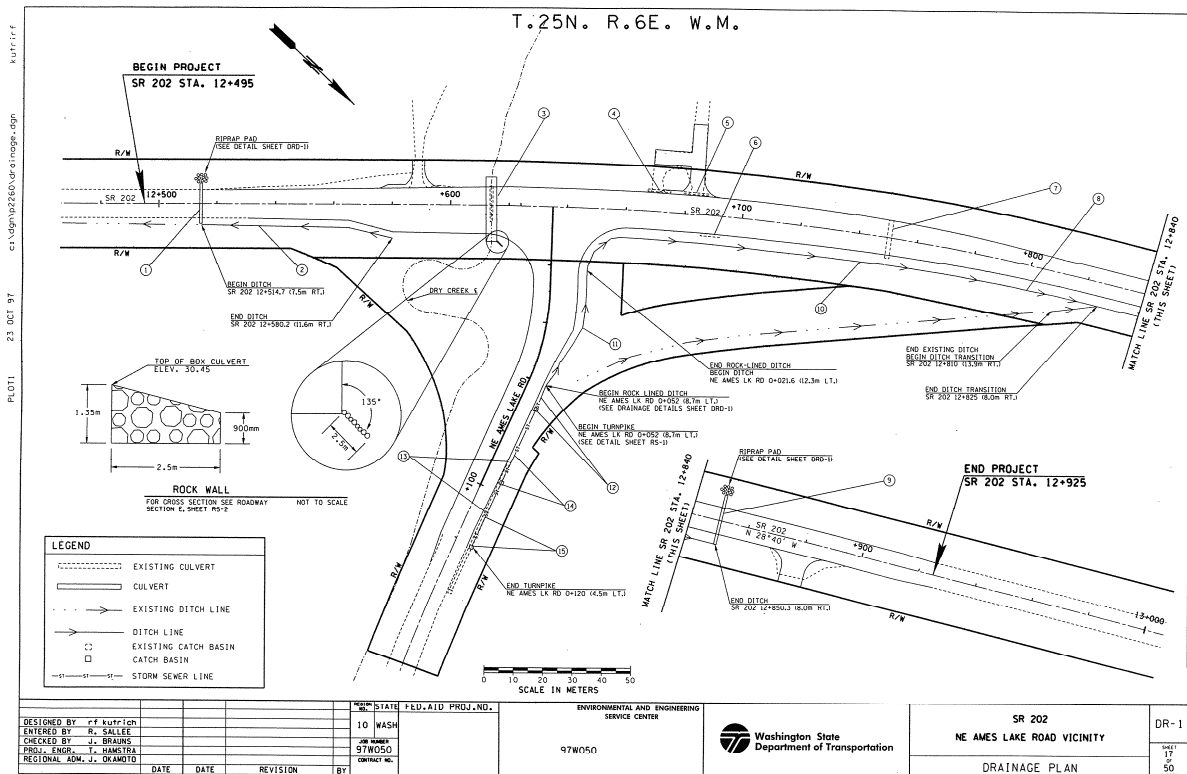
Detour Plans



For simple detours in remote areas & not involving major highway junctions, you may be able to show the Detour Plan(s) on the Vicinity Map.

More involved detours or those involving larger volumes of traffic, work in Cities, etc. you may need to develop separate Detour Plans. These should be thoroughly thought out & reviewed prior to including in your project.

Drainage Plans



Make an early assessment as to whether stand alone drainage plans will be needed for your contract or not.

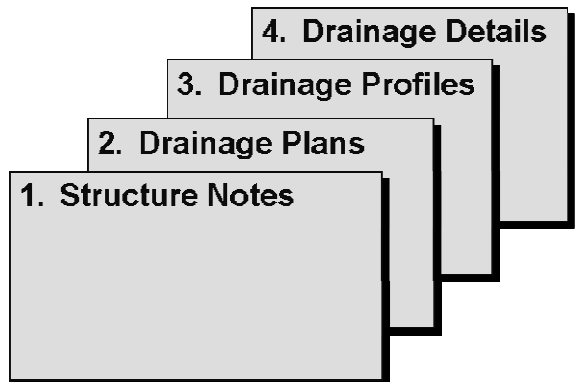
Drainage Plan Series

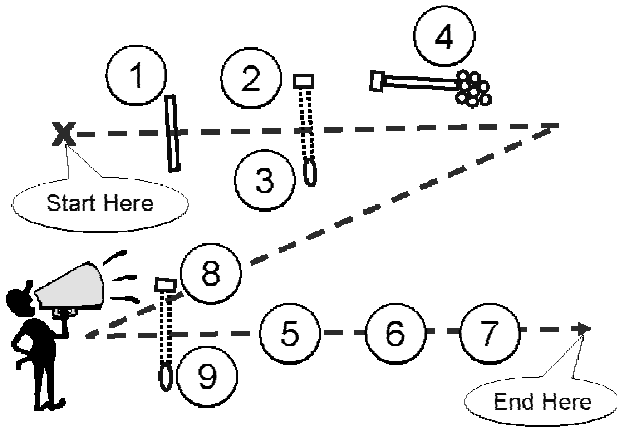
Minor drainage work may be combined with other plan series, provided no overcrowding occurs.

Likewise, minimal drainage may mean that drainage bid items can be consolidated

on the _____ or

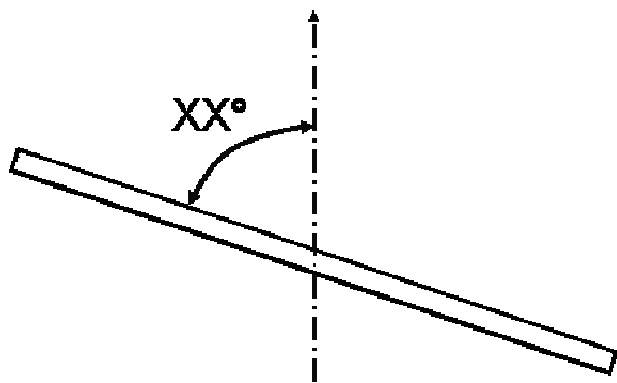
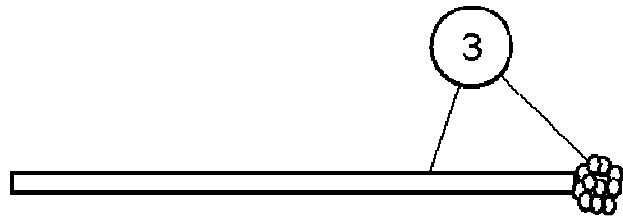
in a _____ on the Drainage Plan sheet.





Drainage feature numbering begins in the upper left corner of the sheet and works back & forth, left & right of centerline and progresses across and down the sheet ending in the lower right corner.

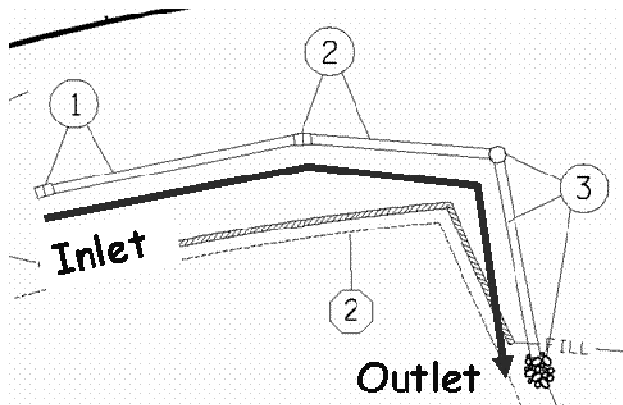
The structure code for cross pipes shall include the pipe and the outlet treatment.

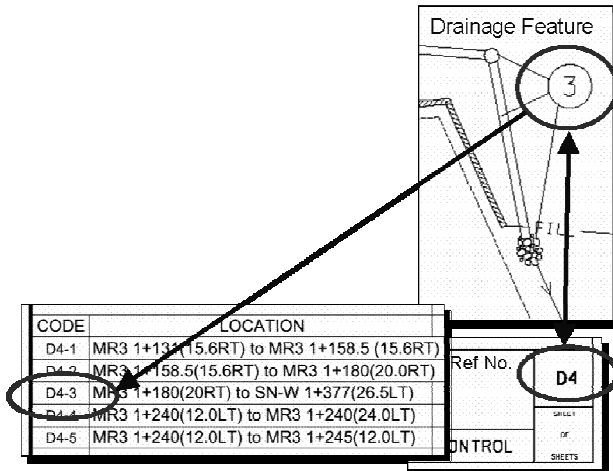


Cross pipes can be shown 2 ways:

_____ or
 _____ of
 each end in the Structure Note

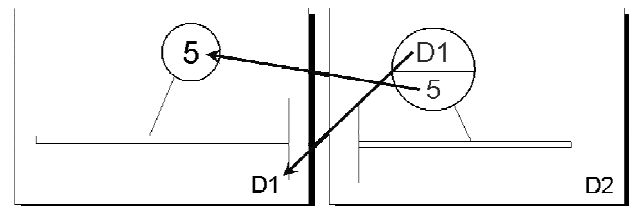
In a closed drainage system as illustrated here, each structure note includes the pipe and the associated drainage structure (i.e. Inlet, catch basin, manhole, etc) on the inlet end of the pipe.





The structure note code consists of a combination of the

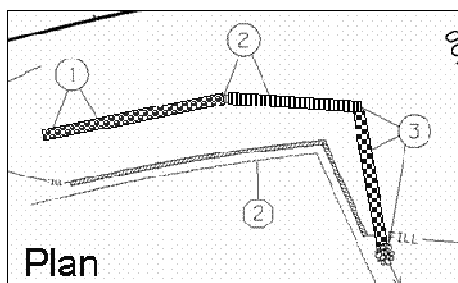
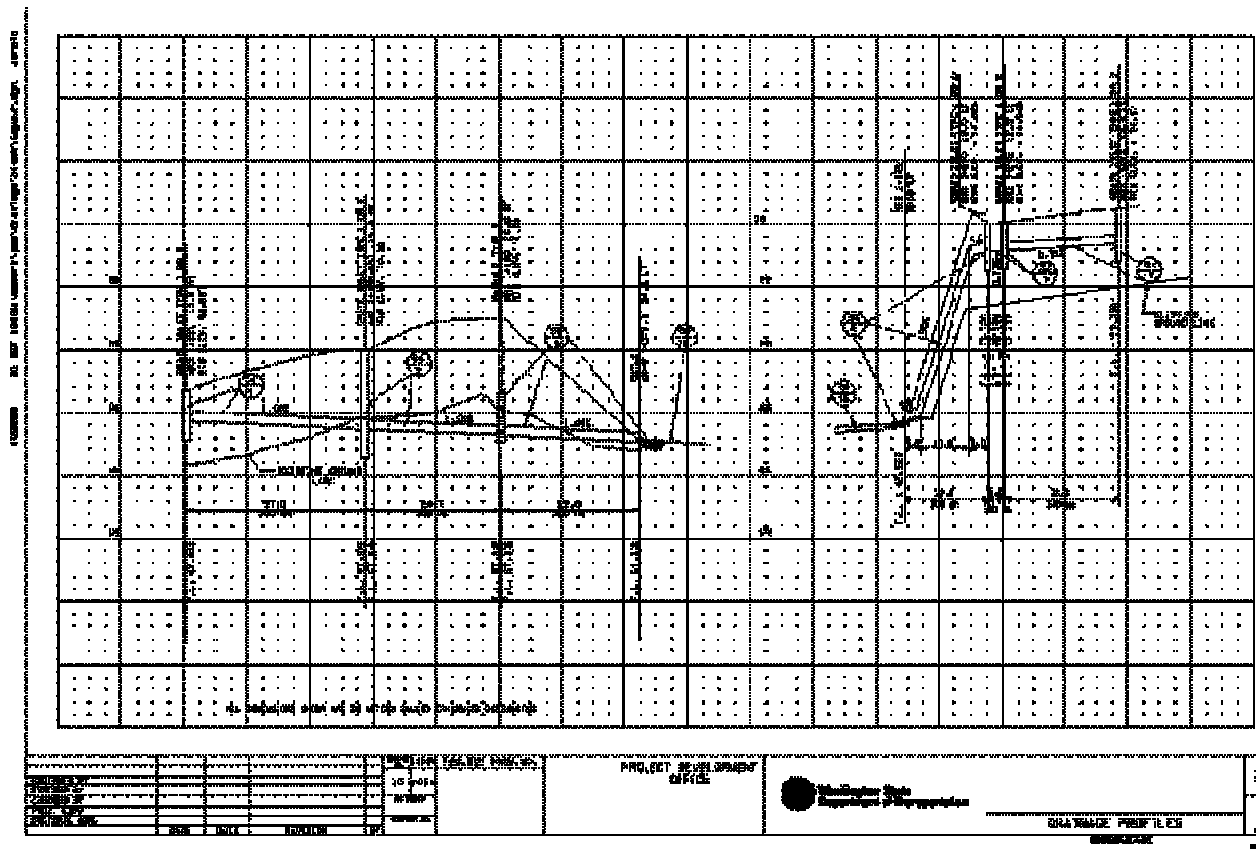
If a drainage feature (such as a culvert) extends over more than one sheet, the Structure Note flags are set up as shown here



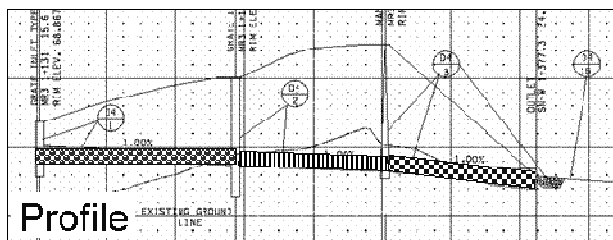
Other considerations include:

- If multiple pipes are to be placed in the same trench, they may be combined under a single structure code.
- Roadway and median ditches are not to be shown on the drainage plans. These ditches are constructed as part of the roadway section, and the work is included in the earthwork items. Only ditches that will be paid as ditch excavation are to be shown on the drainage plans.

Drainage Profiles



Although the pipes turn angles in Plan View, each segment is laid out “flat” in the Profile View.





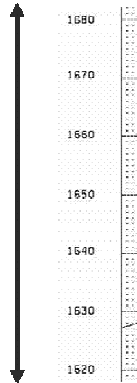
= Manhole



= Other Structures
(Catch Basins, Inlets,
etc.)

Manholes are to be drawn as elongated triangles. All other drainage structures such as catch basins, inlets; etc. are to be drawn as elongated rectangles.

- **Vertical scale controlled by the selected grid scale**



- **Draw pipe lengths and diameters in proportion to each other:**

10 foot pipe vs. 5 foot pipe (2x's longer)



24-inch diam. pipe vs. 12-inch diam.



The following information is to appear on the drainage profiles:

- ✓ Inlet and outlet flow line elevations of pipes, (shown below the pipe profile).
- ✓ Outflow treatments such as riprap, quarry spalls, and, if the ditch is other than a roadway or median ditch, ditch profiles.
- ✓ Debris deflectors, standpipes and headwalls.
- ✓ The type of drainage structure, and station and offset location of the structure, (shown above the structure)
- ✓ The rim elevation of manholes, catch basins, inlets, or other drainage structures, (shown above the structure).
- ✓ The horizontal distance between adjacent drainage structures, from center of structure to center of structure.
- ✓ The size of pipe in each run, (do not have to include the type of pipe).
- ✓ The pipe slope, (carried out to sufficient decimal places so that when the calculation is made from the indicated inlet flow line, on the given grade, for the given distance, the result will be the outlet flow line indicated).
- ✓ Finished ground line above the pipe.
- ✓ Original ground line if pipes will be placed prior to embankment construction or if original ground differs from the finished ground line.

-
- Diagram illustrating the concept of a Common Catch Basin (CB) for multiple pipes. The diagram shows three pipes (Pipe #1, Pipe #2, and Pipe #3) connected to a common catch basin. A callout bubble points to the catch basin area, stating "CB Info Here". A label "SAME CATCH BASIN" indicates that all three pipes share the same catch basin.

All of the information shown on the structure note sheet, and the drainage plans and profiles, will meet the requirements contained in the Hydraulics Manual and Standard Plans. Structure note sheets are used to tabulate bid items, their locations, unit of measure, and general notes pertaining to the drainage items, utilities, water lines etc.

[illegible]

Structure Notes will be covered in more detail in the Estimates section of this Manual.

Drainage Details

Drainage details, such as the layout of a detention pond, may be required at a larger scale to provide sufficient information or required dimensioning to clearly show the construction. These details will follow immediately after the Drainage series of plans.

Drainage Exercise

Instructions

Use PPM 400.06(14) and 400.06(15) and example 4-22 and 4-23 to assist you in this exercise.

Complete the Drainage Plans and Drainage Profile sheets for the following codes using the information from the Structure Notes and PPM:

DPM1-4

DPM1-5

DPM1-6

DPM2-4

Given:

Structure Notes DN1

Drainage Plans DPM1 and DPM2

Drainage Profile DP1

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Plans Prepared by Others

I need some help!

A variety of plans are prepared outside of the project office. This work is performed by various WSDOT specialty offices and occasionally by consultants. This work is done because of specialized expertise that is sometimes needed or because of staffing constraints.

General Considerations

The work that is to be done by these various support groups needs to be identified during the project scoping phase of the project and the support groups need to be included in the chartering of the team. A delivery commitment is made when the support group endorses the Work Plan.

The Project Office needs to actively manage the Work Plan and communicate regularly with this support groups. Communication is very important.



Hydraulics

- ✓ Hydraulic Design of Drainage Facilities
- ✓ Structural Design of Hydraulic Structures
- ✓ Analysis & Design of Streambank Erosion & Mitigation
- ✓ Flood Plain Studies & River Hydraulic Analysis

Utilities

- ✓ Agreements
- ✓ Access
- ✓ Permits & Franchises



Right Of Way

- ✓ Acquisition
- ✓ Property Management

Geotechnical

- ✓ Subsurface Investigation
- ✓ Structure Foundation Design
- ✓ Retaining Wall Design
- ✓ Rock Slope Design



Traffic

- ✓ Illumination
- ✓ Traffic Signals
- ✓ Intelligent Transportation Systems (ITS)
- ✓ Permanent Signing



Bridge

- ✓ Construction & Demolition
- ✓ Structural Repair & Modification
- ✓ Washing & Painting
- ✓ Scour Repair

Roadside and Site Development

- ✓ Roadside Restoration
- ✓ Irrigation
- ✓ Wetland Mitigation
- ✓ Contour Grading
- ✓ Irrigation Plans



Other Offices

- ✓ Cost Risk Assessment (CRA)
- ✓ Project Development
- ✓ Design Policy
- ✓ Strategic Analysis Estimating
- ✓ Value Engineering
- ✓ Construction Office
- ✓ Materials Laboratory
- ✓ Maintenance and Operations

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Let's Test your Knowledge

1. What are two of the three reasons we prepare cost estimates?

2. What are the two types of estimating?

3. A roadway has two 12' lanes and two 6 foot shoulders and your project is 12,110 feet long. The roadway will be overlaid with 0.15' of Asphalt Conc. Pavement Class A. How many tons will be needed?

4. Using the answer from the previous question, what is the rounded value that is placed on the Summary of Quantities?

5. What is the basis for selecting a unit price using bid history data?
- a. The closest price based on a statewide average price
 - b. The closest price based on a region average price
 - c. The closest price based on similar location, size and type of project, and similar quantity
 - d. The closest price based on comparable quantity, regardless of project location

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Programming Overview

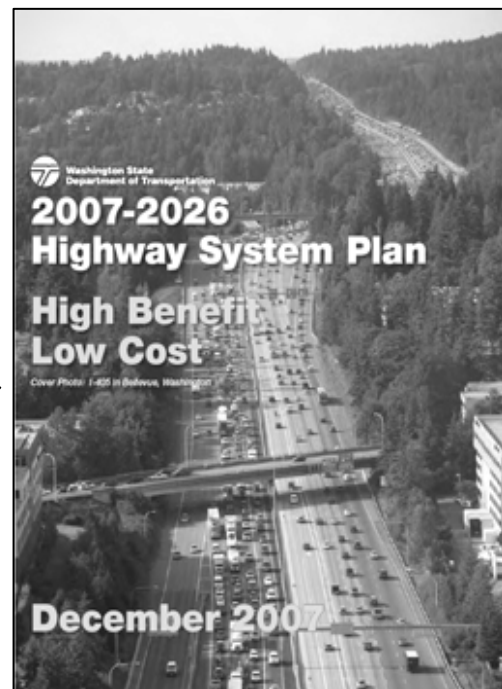
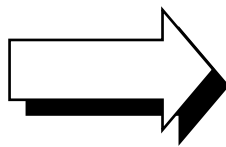
How does the money get spent?

The Strategic Planning and Programming works to ensure the delivery of highway construction programs at the state level; the office meets program commitments by allocating funds, monitoring progress, and reporting results to funding stakeholders; and the office manages resources to most efficiently preserve and improve the state highway system and to meet service objectives identified in the Highway System Plan.

Three branches make up the Strategic Planning and Programming Office.

- ✓ Improvement Branch
- ✓ Preservation Branch
- ✓ Program & System Support Branch

Highway System Plan



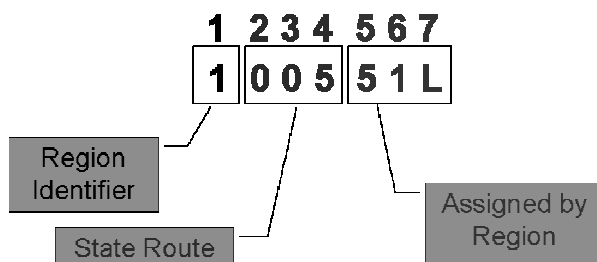
The Highway System Plan is WSDOT's plan for _____, _____, and _____ the state's highway system over the next 20 years.

The Highway System Plan identifies the funding needs in 4 program areas.

- P Highway Preservation
- I Highway Improvement
- M Highway Maintenance
- Q Traffic Operations

Program Item Number

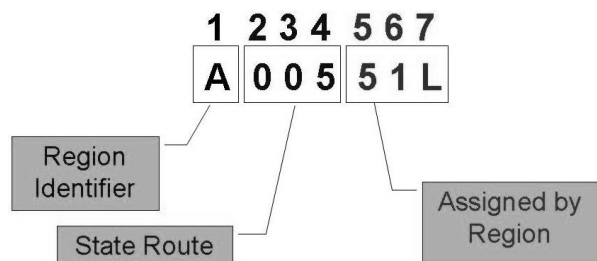
When WSDOT begins working on needs and deficiencies in the Highway System Plan, they are assigned a Program Item Number (PIN). The PIN is used for tracking the needs and deficiencies in the Capital Program Management System database.



The PIN is a unique 7-character identifier and ties the need or deficiency to the Subprogram.

Work Item Number

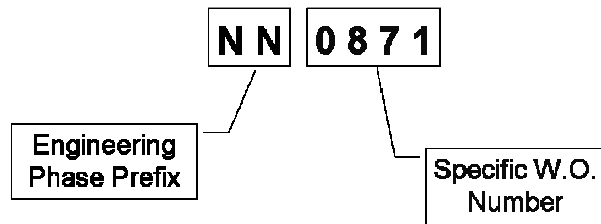
After needs and deficiencies in the Highway System Plan are assigned PIN numbers, WSDOT will choose which PINs should be combined to make up a project. The project is then assigned a Work Item Number. This number is used for tracking the project and its associated PINs in the Capital Program Management System database.



The WIN is a unique 7-character identifier.

Work Order Number

Work Orders are authorization to charge to a certain WIN number (project). There are up to 3 phases in a project; each will have its own Work Order number.

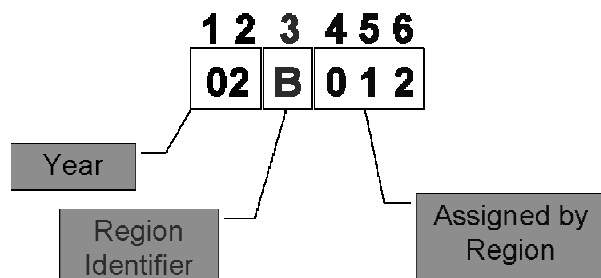


The 3 phases of work that require Work Orders numbers are:

Phase	Work Order Prefix
Construction	_____
Preliminary Engineering	_____
Right of Way	_____

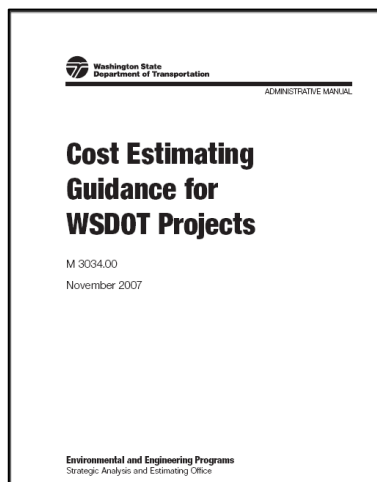
PSE Number

PSE numbers are assigned by the Region and are used to tie the estimate in EBASE to the set of plans.



The image shows two sheets of an index: 'INDEX' and 'INDEX (CONTINUED)'. Both sheets have columns for 'SHEET NO.', 'PLAN REFERENCE NO.', and 'TITLE'. The 'INDEX' sheet has a circled area at the bottom right.

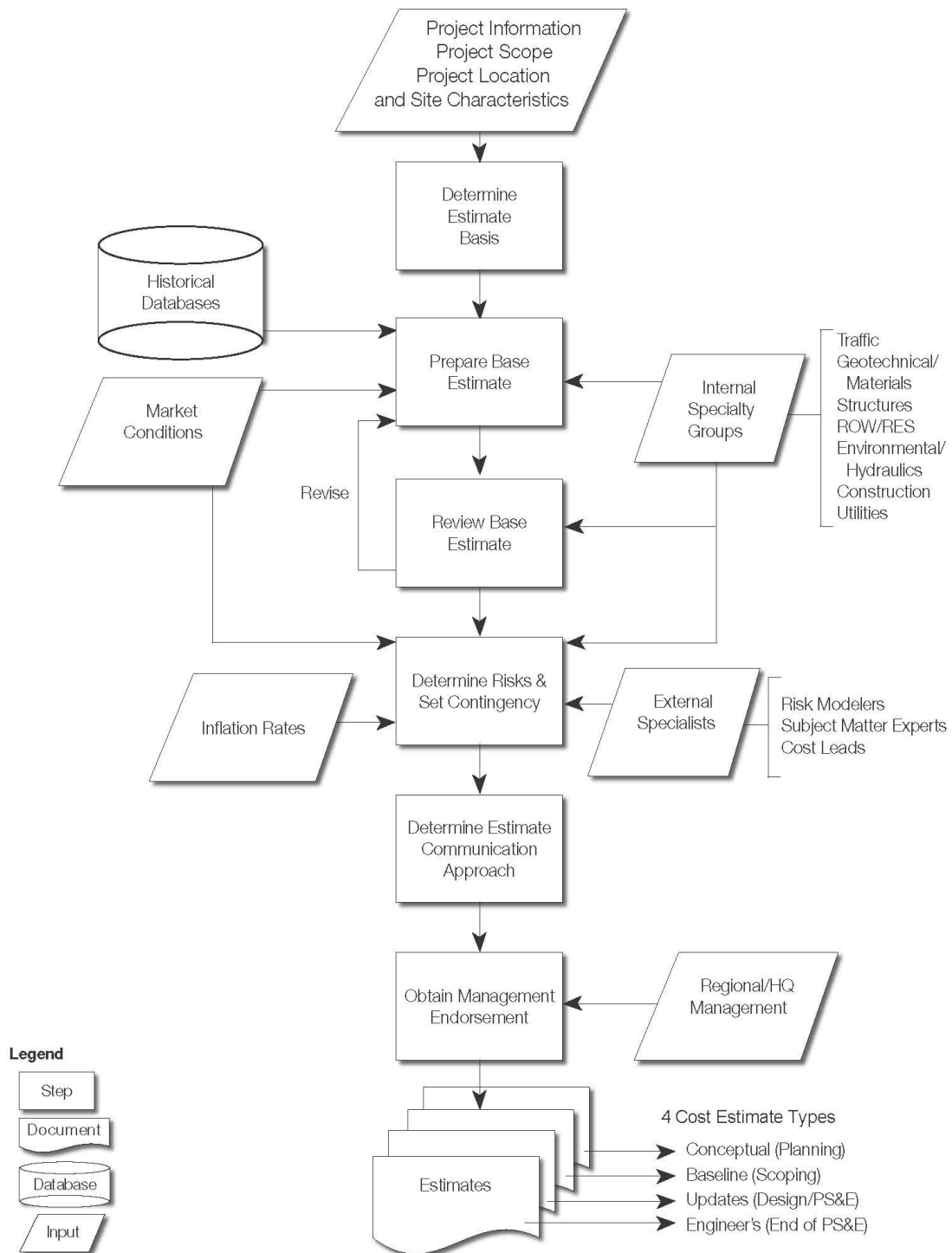
Estimating Guidance



Provides guidance for a consistent approach to:

- Cost Estimating
- Estimating Review
- Estimating Documentation
- Management of Estimating Data

Cost Estimate Process



Determine Estimate Base

- Gather scope information
- Request Specialty Group input
- Evaluate site conditions
- Organize project scope and site information
- Begin filling out Basis of Estimate Form

Prepare Base Estimate

- Determine applicable estimating technique(s)
- Develop estimate information
- Apply estimate technique(s)
- Document estimate assumptions and bases
- Summarize base cost estimate

Review Base Estimate

- Determine level of review
- Review estimate basis and assumptions
- Verify completeness and use of estimating information and data
- Reconcile with current estimate
- Prepare estimate package

Determine Risk & Set Contingencies

- Determine level of risk analysis
- Identify risks
- Perform qualitative and/or quantitative risk analysis
- Determine total project cost

Determine Estimate Communication Approach

- Determine stakeholder information needs
- Develop appropriate communication methods
- Release cost estimate for inclusion in PMP plan

Obtain Management Endorsement

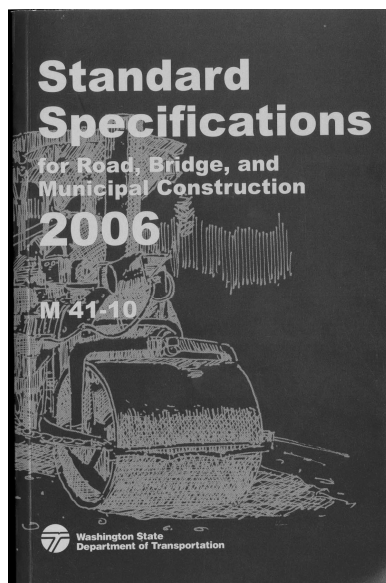
- Prepare estimate summary
- Obtain management approval
- Release project cost estimate

Resources & Tools

There are a variety of people to assist you in creating an estimate.

- ✓ Team Leader
- ✓ Asst PE or PE
- ✓ Other Estimators and EBASE Users
- ✓ Plans Office (Anytime during design phase)
- ✓ Program Management (All phases- Fund Sources, Budgets)
- ✓ Subject Matter Experts (Traffic, Landscape, Environmental, etc.)
- ✓ Construction Staff
- ✓ Headquarter Design
- ✓ Strategic Analysis & Estimating Section
 - Estimating Unit
 - PS&E Support

Standard Specifications



Division 1

1-09.1 Measurement of Quantities

All measurements are to be made as described in this section, unless individual specifications require otherwise.

Divisions 2 – 8

X-XX.1 Description of Work

X-XX.2 Materials

X-XX.3 Construction Requirements

X-XX.4 Measurement (e.g. 8-11.4)

X-XX.5 Payment

Plans Preparation Manual

Division 7

Miscellaneous Contract Considerations.

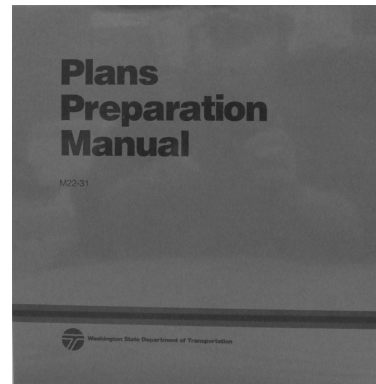
Calculation formulas for asphalt adjustment items and other information pertinent to estimate preparation in this section.

Division 8

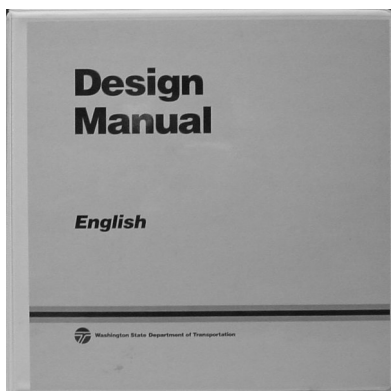
Contract Estimate

Appendix A1

Q-Tab, SN Instructions



Design Manual



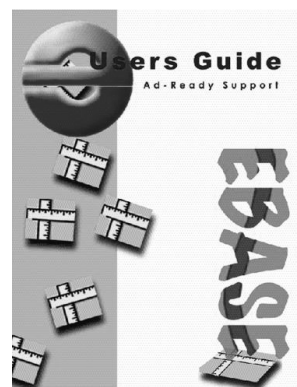
Division 5

Estimating Tables & Conversion Factors for Surfacing and Paving Materials

EBASE User Guide

- Technical Support & Training
- Tomi-Hume Pontius
- Available online:

www.wsdot.wa.gov/eesc/design/projectdev/AdReady/EBASE.htm





- Technical Support & Training
- Tomi-Hume Pontius
- Available online:

<http://www.wsdot.wa.gov/Design/ProjectDev/EngineeringApplications/BidTabs.htm>

Types of Estimating

Why do we prepare cost estimates?

To obligate _____

To determine _____

To provide _____

Project Development Level	Project Maturity (% of design completed)	Purpose of Estimate	Methodology	Estimate Range
Planning WTP/HSP Design Studies Route Development Plans	0% to 2%	Screening or Feasibility WTP/HSP (20 Year Plan) WTP – Washington Transportation Plan HSP – Highway Systems Plan	Risk-based or Judgment Historical % Similar Projects Parametric MP3 PLCE	-50% to +200%
	1% to 15%	Concept Study or Feasibility Implementation Plan (10 Yr. Plan)	Parametric MP3, PLCE Analogous Projects Historical % Risk-based CEVP CRA Self-Modeling	-40% to 100%
Scoping Project Summary (PD, DDS, ERS)	10% to 30%	Budget Authorization or Control Capital Improvement & Preservation Plan (CIPP)	Parametric MP3, PLCE Analogous Projects Historical bid-based (UBA, BidTabs Pro) Risk-based CEVP, CRA Self-Modeling	-30% to +50%
Design Design Documentation I/S Plans for Approval Design Approval	30% to 90%	Design Estimates (Project Control of Scope Schedule Budget)	Historical bid-based (UBA, BidTabs Pro, EBASE) Cost-based Risk-based CEVP CRA Self-Modeling	-10% to +25%
PS&E Plans, Specs, Estimate (R/W Plans approved)	90% to 100%	Engineer's Estimate (prior to bid)	Historical bid-based (UBA, BidTabs Pro, EBASE) Cost-based Risk-based Self-Modeling	-5% to +10%

Cost Estimating Matrix

Two Basic Methods

Historical Bid Based

- Quicker
- Easier

Bid Based Estimating uses _____
_____ and Historical Bid
Prices.

Cost Based takes more time because it is
used for N_____-S_____
items, and F_____ A_____
items or L_____ S_____ items.

Cost Based

- For items
with no
bid history

Bid Based Estimating



Bid Based

Historical bid prices

“Comparable work”

- ✓ Similar project type
- ✓ Same locality
- ✓ Similar quantities

When using the bid data you will need to:

Steps to prepare a cost based estimate for a work item:

1. Identify items
2. Determine labor
3. Determine material needs and unit price
4. Determine equipment needs
5. Calculate quantity and then base costs on unit prices
6. Add contractor overhead and profit
7. Convert to unit price or LS for bid purposes

Determining the unit price

- ✓ Use average pricing
 - Throw out the high and low
- ✓ Examine the Low, 2nd & 3rd bids
 - Major discrepancies?
 - Unusual project circumstances
 - Adjust unit price

Standard Item Tables


Washington State
Department of Transportation

[News](#) | [Employment](#) | [Contact WSDOT](#) | [WSDOT Home](#)

[Traffic & Roads](#) | [Projects](#) | [Business](#) | [Environment](#) | [Maps & Data](#)

Search **Engineering Applications** text size: T T T

Engineering Applications

- [Unit Bid Analysis](#)
- [Bid Tabs Pro / Plus](#)
- [Contract Records](#)
- [Standard Items](#)
- [EBASE](#)
- [Disclaimer](#)
- [Download the Quantity Tabulations application](#)
- [Sign Specification](#)
- [Overview of Engineering Applications](#)
- [Oman Data Errors](#)
- [Starter Estimates](#)

Standard Items

[Project Development](#) > [Engineering Applications](#) > Standard Items

Select a document:

[English Standard Item Table](#) (Revised 3/2008)

[Metric Standard Item Table](#) (Revised 3/2007)

[All WSDOT Standard Items - EXCEL Format](#) (Revised 3/2008)
Raw data for use with your spreadsheet or database
Current English and Metric Standard Bid Items.
Sorted by construction sequence.

[Historic and Current Standard Items](#) - Pdf (Revised 3/2008)
Searchable pdf file

Please see the [Standard Specifications](#) and [Standard Plans](#) for guidance concerning the use of these items in WSDOT projects.

Revisions to the Standard Item Table - New revisions - 3/2008.

[CLICK HERE TO SEE REVISIONS](#)

Page 1 of 82

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

Date: 04/25/2003
DOT-RGG101

STD ITEM NUMBER	UNIT OF MEASURE	*****	PREQUAL CODE	ITEM USE
0001	L.S.	MOBILIZATION	A1	STANDARD ITEM
0002	L.S.	MOBILIZATION----- (43)	A1	REQUIRES SPECIAL PROV.
0025	ACRE	CLEARING AND GRUBBING	D6	STANDARD ITEM
0030	ACRE	CLEARING AND GRUBBING - SITE----- (27)	D6	STANDARD ITEM
0035	L.S.	CLEARING AND GRUBBING	D6	STD. ITEM, GSP REQUIRED
0040	L.S.	CLEARING AND GRUBBING - SITE----- (27)	D6	STD. ITEM, GSP REQUIRED
0044	C.Y.	STRIPPING INCL. HAUL	D6	STANDARD ITEM
0045	C.Y.	STRIPPING INCL. HAUL - SITE----- (28)	D6	STANDARD ITEM
0038	EST.	ARCHAEOLOGICAL AND HIST	A1	GSP ITEM
0047	EACH	REMOVING MANHOLE	G2	REQUIRES SPECIAL PROV.
0049	EACH	REMOVING DRAINAGE STRUC	G2	REQUIRES SPECIAL PROV.
0050	L.S.	REMOVAL OF STRUCTURE AND OBSTRUCTION	F8	STANDARD ITEM
0060	L.S.	REMOVING PORTION OF EXISTING STRUCTURE----- (17)	F8	GSP ITEM
0061	L.S.	REMOVING PORTION OF EXISTING STRUCTURE----- (17)	F8	REQUIRES SPECIAL PROV.
0062	L.S.	REMOVING PORTION OF EXISTING STRUCTURE----- (17)	F8	REQUIRES SPECIAL PROV.

Some items require Add-on Descriptions. (xx) = # characters

Std Items have pre-assigned Prequal Codes

Follow item order *not* item #

Provide GSP or Special Provision as directed by Use Message

Bid Tabulations

Bid Tab Data organized by:

- ✓ Contract Item Number (per EBASE)
 - Proposal Form
 - Summary of Quantities
- ✓ Item Description & Quantity
- ✓ Engineer's Estimate
- ✓ Low Bid thru 3rd Low
- ✓ % Difference from Engineer's Estimate

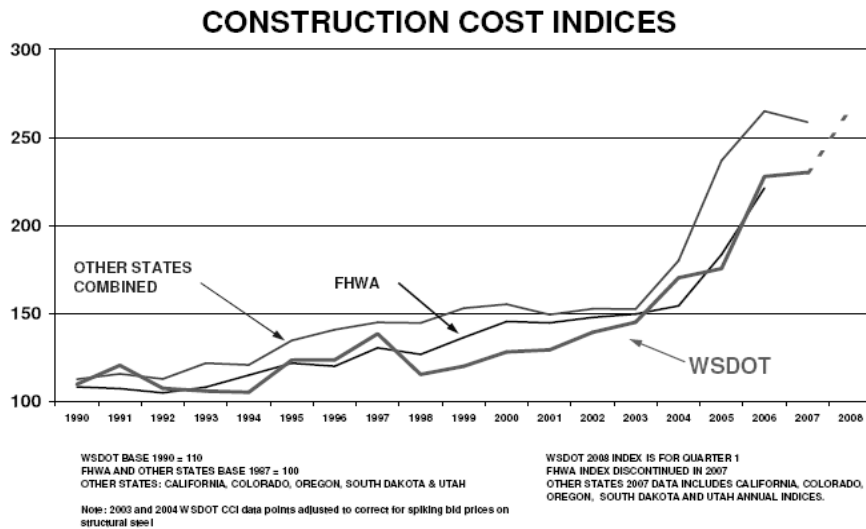
BidTABS Pro



Bid Tabs Pro is a private company software program using data from EBASE that generates reports or queries. Great flexibility is built into this software. Queries can be by contractor, quantity, county, bid letting dates, and many others. This data is mostly used as a cost estimating source.

This program is available to all WSDOT employees. For installation contact your Region IT representative or Headquarters IT Help Desk.

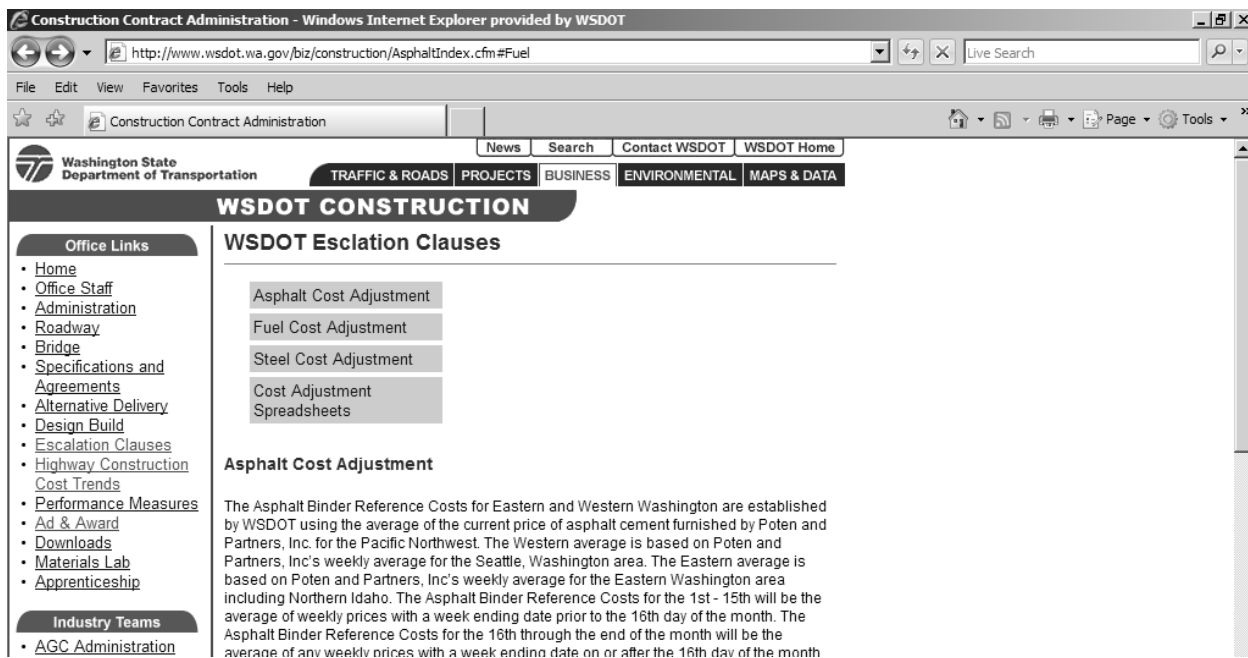
Construction Trends



The cost of construction materials plays an important role in the ability of WSDOT to deliver its highway construction program. Once a project is defined and legislative approval given, tracking the costs of construction materials becomes an important variable in the delivery of a project within scope, schedule and budget.

Seven typical construction bid items -- crushed surfacing, concrete pavement, structural concrete, hot mix asphalt, roadway excavation, steel reinforcing bar and structural steel --are currently tracked. The data, beginning in 1990, is graphed with an accompanying trend line which provides insight into the relative changes in the cost of a material.

WSDOT Escalation Clauses



WSDOT has three different cost escalation clauses, one for asphalt, another for fuel, and another for steel. WSDOT acknowledges the associated risks and their influence on bid prices. Reducing the contractor's risk of price escalation for these materials should result in lower initial bid prices.

Asphalt

Use the revised GSP 04044.GR5 and 04054.GR5 and bid item for "Asphalt Cost Price Adjustment" in contracts that are scheduled to be advertised after September 2, 2008, that contain HMA paving.

Guidance for estimating the amount to be included in the proposal is provided on the HQ Strategic Analysis and Estimating Office at the following address:

<http://www.wsdot.wa.gov/Projects/ProjectMgmt/Risk/Assessment?Information.htm>

Fuel

Use requires Region Construction Manager Approval and concurrence from HQ Construction Administration. At the Region's discretion, use in projects with more than 200 working days that include any of the bid items that are eligible for adjustment. Include an estimated amount for the bid item "Fuel Cost Adjustment" in the Engineers Estimate.

Steel

Use in all projects longer than 200 working days that contain non proprietary walls, and pedestrian or vehicular bridges. Contact the HQ Strategic Analysis and Estimating Unit for assistance preparing the Engineers Estimate for the bid item "Steel Cost Adjustment."

Cost Based Estimating

Cost Based Estimating is for items with no bid history. Also known as “S_____” estimating it incorporates cost & productivity factors.

Four Steps to Cost-Based Estimating

8. Identify work
 - a. Break into Components - Determine Bid Items - Determine Units
9. Estimate Needs
 - a. Materials
 - b. Labor
 - c. Equipment
 - d. Mobilization Costs
 - e. Overhead
 - f. Profit
10. Compute Quantities
11. Determine Unit Price

Things to consider when determining unit price:

- Materials
- Labor
- Equipment
- Mobilization

Resources:

- Estimating Tables (Design Manual)
- Contract Plans
- Survey Data / Field Notes
- Standard Plans
- Standard Specs
- Plans Preparation Manual
- Suppliers
- Senior Designers / Construction Inspectors
- Contractors

Lump Sum Bid Items

When the work is easily defined by:

- ✓ Quantity
- ✓ Amount of effort
- ✓ Equipment
- ✓ Labor

If there is uncertainty, in any of the above, switch to _____ or _____ instead.

Include pertinent back up data in the Design file.

Lump sum bid items may include:

- ✓ Several items of work
- ✓ Same work at several different locations

A Special Provision is required:

- ✓ Description of lump sum work (non-standard)
- ✓ Location & quantities

Preparation is similar to cost-based estimating procedure:

1. Identify work to be included in item
2. Estimate material-equipment needs.
3. Compute quantities
4. Determine prices of individual elements
5. Determine sum total

Force Account Work

When Quantity, Labor, Materials, Equipment or Work Methods cannot easily define work, use “C_____ P_____” per Section 1-09.6 & PPM 750.09

- ✓ Contracting Agency controls work performed
- ✓ “As directed by Engineer” (Only time used)
- ✓ Std Item 7715 - User-defined force account items

Force Account - Standard Specifications 1-09.6



**Washington State
Department of Transportation**

Daily Report of Force Account Worked

Contract: 007137 - SR 14, BERGEN ROAD VICINITY ROCKFALLS Prime: 910680994 - SCARSELLA BROS. INC.

Item No: 0014 - FORCE ACCOUNT STONE WALL REPAIR Done By: 912011075 - CUSTOM MASONRY

Work: Wash wall, prep work, masonry repair Date: June 27, 2006 Sheet: 1

Labor Worked:											
Worker Name	Occupation	Pay Group	Reg	O/T	D/T	Reg	O/T	D/T	Hours		Total
Ben Downing	Cement Mason	2	47.08	61.10	0.00	8	3.5	0			\$590.49
Charles Sarkinen	Hod Carrier	2	42.58	56.54	0.00	8	3.5	0			\$538.53
Craig Homola	Cement Mason	2	47.08	61.10	0.00	8	3.2	0			\$572.16
Jack Uskoski	Hod Carrier	2	42.57	56.54	0.00	8	3.5	0			\$538.45
Jason Korri	Hod Carrier	2	42.58	56.54	0.00	8	3.5	0			\$538.53
Nels Homola	Cement Mason	2	47.08	61.10	0.00	1	0	0			\$47.08
Subtotal											\$2,825.24
Overhead / Profit										29%	\$819.31
Labor Total											\$3,644.55

Equipment Worked:											
Equip#	Type	Manufacturer	Model	Year	Capacity	Group	Reg Rate	Standby Rate	Reg Hours	Standby Hours	Total
CMI-1	Generator	Honda	EB-11000	2005	20 HP	2	7.80	0.73	11	0	\$94.18
CMI-10	Flatbed	Ford	F-450	2002	1 ton	2	19.07	3.74	11	0	\$225.08
CMI-2	Pressure Tank	Landa	PG-5-3500	2005	3000 psi	2	9.19	2.17	11	0	\$107.49
CMI-3	Water Tank	American	Water Tanks	2005	100 to 500 g	2	5.00	2.00	11	0	\$56.32
CMI-4	4x4 Pickup	Chevrolet	2500 Silverado	2004	3/4 ton	2	10.45	1.98	8	0	\$89.84
CMI-6	Paddle Mixer	Collomix	C-X20	2003	Electric	2	0.73	0.19	11	0	\$8.49
Subtotal											\$581.40
Overhead / Profit										21%	\$122.10
Equipment Total											\$703.50

Invoiced Items:							
Invoice No	Line Item	Description	Group	Tax	Quantity	Price	Total
VR647629S	001	MORTAR TYPE S - 80lbs bags CLR DAVIS DISP BLACK - 8lbs	2	8.10%	1	\$427.57	\$462.20
Subtotal							\$462.20
Overhead / Profit						21%	\$97.06
Invoice Total							\$559.26

Grand Sub Total \$4,907.34

Prime Markup* \$588.88

* Prime Markup Breakdown 12%: 4907.34 10%: 0.00 7%: 0.00

Grand Total \$5,496.22

Tuesday, July 11, 2006 11:35 AM

Page 1 of 2

Notice the mark-ups on Labor, Equipment, and Materials. Other mark-ups include subcontractor and the prime contractor's.

Measurement

List some of the ways we measure work

Length

Area

Volume

Weight

Time

Unit

Rounding Quantities

Quantities listed in the summary of quantities are intended to be representative of the work to be performed. Rounding will take place each time a quantity is placed on a quantity tabulation sheet, on a profile sheet, or other location in the plans. The total of the rounded quantities will be carried forward to the summary of quantities.

The following general rules shall apply to the rounding of quantities:

1. Items having an estimated unit price of \$9.99 or less will be shown to the highest multiple of 10. For example, 3,640 (not 3,637) units of haul at \$0.50, and 560 (not 554) tons of ballast at \$1.25.
2. Items with an estimated unit price of \$10.00 to \$99.99 will be shown to the nearest full digit. For example, 61 (not 60.5) cubic yards of concrete at \$43.00.
3. Items with an estimated unit price of \$100.00 or more will be shown to one decimal place. For example, 18.3 (not 18.25) acres of clearing at \$1500.00.
4. Exceptions to numbers 1, 2, and 3 above:
 - a. Earthwork items, roadway excavation, embankment compaction, and borrow excavations are to be rounded to the nearest multiple of 10 units, regardless of price. The rounding for roadway excavation and embankment compaction will be made for each entry on the profile sheets. The borrow quantities will be rounded to the nearest 10 units and placed on the summary of quantities. On a new construction project, with extremely large earthwork quantities, the quantities could even be rounded to the nearest 50 units at each entry on the profile sheets.
 - b. HMA and crushed surfacing items are to be rounded to the nearest 10 units.
 - c. Pipe items will be rounded to the nearest foot for each pipe run entered on the structure note sheets, regardless of price.

Unit Bid Analysis Exercise

Instructions

Calculate the approximate quantity of HMA Class ½ inch required for Roadway Section A.

Use the Plans Preparation Manual to determine the appropriate rounding to be used.

Use bid history data to determine a unit price for the asphalt.

Given

Roadway Section Answer Sheet from yesterday, (Assume that all the shoulders 3' wide)

Design Manual Table 520-2a

Unit Bid History

Plans Preparation Manual Section 400.06

Bonus

Calculate the approximate quantity & price of Planing Bituminous Pavement required for Roadway Section A.

General Data 1, 2, 3														
Hot Mix Asphalt Pavement														
Complete Mix														
Class of Mix	Depth (ft)	Spread per sy		sy per ton	Tons/Mile Width (ft)									
		lb	ton		10	11	12							
HMA	0.10	137	0.0685	14.60	402	442	482							
Prime Coats and Fog Seal														
Asphalt								Aggregate						
Application	Type of Asphalt ⁴	Application gal ⁵ per sy	Tons ⁵ per sy	Tons/Mile Width (ft)			Application lb per sy	Tons/Mile Width (ft)			cy per sy	cy/Mile Width (ft)		
				10	11	12		10	11	12		10	11	12
Prime Coat	MC-250	0.25	0.001004	5.9	6.5	7.1	30	88	97	106	0.0105	62	68	74
Fog Seal	CSS-1	0.04	0.000167	1.0	1.1	1.2								
Specific Data 1 2 3														
Hot Mix Asphalt Paving Quantities (tons/mile)*														
Width (ft)	Depth of Pavement (ft)													
	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75
4	161	241	321	402	482	563	643	723	804	884	964	1045	1125	1206
6	241	362	482	603	723	844	964	1085	1206	1326	1447	1567	1688	1808
8	321	482	643	804	964	1125	1286	1447	1607	1768	1929	2090	2250	2411
10	402	603	804	1005	1206	1407	1607	1808	2009	2210	2411	2612	2813	3014
11	442	663	884	1105	1326	1547	1768	1989	2210	2431	2652	2873	3094	3315
12	482	723	964	1206	1447	1688	1929	2170	2411	2652	2893	3135	3376	3617
22	884	1326	1768	2210	2652	3094	3536	3978	4421	4863	5305	5747	6189	6631
24	964	1447	1929	2411	2893	3376	3858	4340	4822	5305	5787	6269	6751	7234
* Based on 137 lbs/sy of 0.10 ft compacted depth = 2.05 tons/cy														

- 1 The specific gravity of the aggregate will affect the weight of aggregate in the completed mix.
- 2 The percentage of fine mineral in the coarse aggregate will affect the ratio of coarse to fine. If the coarse aggregate produced contains an excessive amount of fines (1/4" to 0), increase the percentage of coarse aggregate and decrease the fines accordingly.
- 3 Quantities shown do not provide for widening, waste from stockpile, or thickened edges.
- 4 The column "Type of Asphalt" is shown for the purpose of conversion to proper weights for the asphalt being used and does not imply that the particular grade shown is required for the respective treatment.
- 5 Quantities shown are retained (residual) asphalt.

**Estimating – Hot Mix Asphalt Pavement
and Asphalt Distribution Tables**
Figure 520-2a

WASHINGTON
PAY ITEM REPORT

Date: 06/10/2008
Time: 03:49:08

WSDOT

Pay Item: 5711 PLANING BITUMINOUS PAVEMENT

TOTALS	High: Low:	15.00 2.00	Wtd. Average: Strt. Average: Std Deviation:	6.88 6.92 3.40	Total Quan: Avg. Quan:	32,805.00 2,733.75	Count: Median:	12 688
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Contractor	Project No.	County	Position	Bid Date	Quantity	Unit	Unit Price	Extension
tri-state construction, inc.	007350 sr 518 sr 509 to i-5/i-405 - wideni	king	1	06/13/2007	2,770.00	S.Y.	9.00	24,930.00
dary merlino construction co., inc.	007350 sr 518 sr 509 to i-5/i-405 - wideni	king	3	06/13/2007	2,770.00	S.Y.	10.00	27,700.00
mowat construction company	007350 sr 518 sr 509 to i-5/i-405 - wideni	king	2	06/13/2007	2,770.00	S.Y.	15.00	41,550.00
scarsella bros. inc.	007405 sr 530 sauk river bank protection 0	skagit	3	09/06/2007	2,960.00	S.Y.	4.00	11,840.00
kib construction inc.	007405 sr 530 sauk river bank protection 0	skagit	2	09/06/2007	2,960.00	S.Y.	5.00	14,800.00
wilder construction company	007405 sr 530 sauk river bank protection 0	skagit	1	09/06/2007	2,960.00	S.Y.	2.00	5,920.00
max i. kuney company	007417 i-405 ne 10th st - bridge crossing	king	1	11/28/2007	2,670.00	S.Y.	4.25	11,347.50
mowat construction company	007417 i-405 ne 10th st - bridge crossing	king	2	11/28/2007	2,670.00	S.Y.	8.00	21,360.00
shea graham construction	007417 i-405 ne 10th st - bridge crossing	king	3	11/28/2007	2,670.00	S.Y.	7.00	18,690.00
max i. kuney company	007431 sr 522 university of washington bot	king	3	12/12/2007	2,535.00	S.Y.	6.90	17,491.50
scarsella bros. inc.	007431 sr 522 university of washington bot	king	2	12/12/2007	2,535.00	S.Y.	6.85	17,364.75
mowat construction company	007431 sr 522 university of washington bot	king	1	12/12/2007	2,535.00	S.Y.	5.00	12,675.00

Report Settings
Selected Pay Item: 5711 :planning bituminous pavement
Include Bidders: Low 3 Bids
Self County/Region: DOT Region 1
Include Lettings: Last 12 Months
Quantity Range: From 2,000.00 to 4,000.00 S.Y.
Omit High/Low Price: NO

BidTabs Professional

Page: 1

ENGLISH Units

WASHINGTON PAY ITEM REPORT

Date: 06/10/2008
Time: 03:17:25

WSDOT

Pay Item: 5767 HMA CL. 1/2 IN. PG 70-28

TOTALS	High: Low:	100.00 67.00	Wtd. Average: Std. Average:	86.57 86.57	Total Quan: Avg. Quan:	14,232.00 1,581.33	Count: Median:	9 87.50
			Std Deviation:	11.58				

Contractor	Project No.	County	Position	Bid Date	Quantity Unit	Unit Price	Extension
woodworth & company, inc	007383 i-5 southbound ramp at port of taco	perce	1	06/27/2007	1,510.00 TON	67.00	101,170.00
tucci & sons, inc.	007383 i-5 southbound ramp at port of taco	perce	2	06/27/2007	1,510.00 TON	73.65	111,211.50
klb construction inc.	007383 i-5 southbound ramp at port of taco	perce	3	06/27/2007	1,510.00 TON	78.50	118,535.00
scarsella bros. inc.	007504 us 101 / sr 3 on ramp to us 101 nor	mason	2	03/26/2008	1,764.00 TON	90.00	158,760.00
roanlin's, inc.	007504 us 101 / sr 3 on ramp to us 101 nor	mason	3	03/26/2008	1,764.00 TON	90.00	158,760.00
tri-slate construction, inc.	007504 us 101 / sr 3 on ramp to us 101 nor	mason	1	03/26/2008	1,764.00 TON	85.00	149,940.00
quigd bros., inc.	007521 us 101 west fork hoquiam river brid	grays harbor	2	04/02/2008	1,470.00 TON	100.00	147,000.00
roanlin's, inc.	007521 us 101 west fork hoquiam river brid	grays harbor	3	04/02/2008	1,470.00 TON	100.00	147,000.00
ross bros. & company, inc	007521 us 101 west fork hoquiam river brid	grays harbor	1	04/02/2008	1,470.00 TON	95.00	139,650.00

Report Settings
Selected Pay Item: 5767 :hma cl. 1/2 in. pg 70-28
Include Bidders: Low 3 Bids
Set County/Region: DOT Region 3
Include Lettings: Last 12 Months
Quantity Range: From 1,000.00 to 2,500.00 TON
Omit High/Low Price:NO

BidTabs Professional

Page: 1

ENGLISH Units

Quantity Tabs, Structure Notes & Profiles

Keeping track of the all the little items

The Quantity-Tabulation and Structure Note templates and Users' Guide are maintained by the HQ Project Development Office. They are available for downloading thru their website <http://www.wsdot.wa.gov/eesc/design/projectdev/AdReady/QuantityTabulations.htm>

Quantity Tabulations

Quantity tabulation sheets are used to tabulate the _____, _____, _____, and notes pertaining to specific bid items.

QUANTITY TABULATION - REMOVAL ITEMS														
NOTE: THE FIRST NUMBER OF THE "CODE" BELOW REFERS TO THE SHEET NO. OR THE SHEET REFERENCE NO. SHOWING THE CONSTRUCTION FEATURE. THE SECOND NUMBER REFERS TO THE CONSTRUCTION FEATURE FOUND ON THAT SHEET.										GENERAL NOTES:				
CODE	LOCATION & UNIT OF MEASURE	REMOVING ASPHALT CONC. PAVEMENT	REMOVING GUARDRAIL	REMOVING GUARDRAIL ANCHOR	REMOVING WIRE FENCE								SEE GENERAL NOTES	
AU1	SRB 49+56.9 TO 59+00 (44' LT.)	1,094											1. SEE SPECIAL PROVISIONS DIVISION 2, PAGE 66.	
AU2	SRB 59+00 TO 68+00 (44' LT.)	850												
AU2	SRB 60+46.5 TO 68+00 (44' RT.)	893												
AU2	SRB 66+57 TO 68+00 (16' RT.)	75												
AU2	DBS 10+00 (50' LT.) TO 16+38.3 (75' LT.)				50									
AU2	W-NS 10+74.9 (174.3' RT.) TO 12+40.6 (102' RT.)				200									
AU3	SRB 68+00 TO 69+19 (44' LT.)	131												
AU3	SRB 68+00 TO 80+00 (RT.)	1,784												
AU3	SRB 68+33 TO 74+19 (LT.)	667												
AU3	SRB 68+00 TO 69+00 (44' RT.)	116												
AU3	SRB 69+19 TO 80+00 (LT.)	3027												
AU3	SRB 69+13 TO 71+53 (55' RT.)	2671												
AU3	SRB 78+20 TO 80+00 (44' RT.)	206												
AU3	E-NS 17+42.3 (47' RT.) TO MC-N 14+00.0 (57' LT.)		520	2										
AU3	NS-W 11+02.7 (31' RT.) TO MC-N 14+74.3 (24' RT.)		410	2										
AU4	SRB 80+00 TO 83+39.1 (44' LT.)	385												
AU4	SRB 80+00 TO 84+65 (RT.)	238												
AU4	SRB 80+00 TO 94+37.3 (44' RT.)	1,605												
AU5	DBS 7+04.85 TO NS-W 9+80 & E-NS 19+00.0 (LT. & RT.)	7069												
AU6	W-NS 16+99.29 TO W-NS 17+74.53 (LT. & RT.)	221												
AU6	NS-E 9+75.24 TO NS-E 9+00 (LT. & RT.)	221												
AU6	MC-S 10+00 TO MC-S 13+59.85 (LT. & RT.)	2238												
AU6	DBS 25+00 TO DBS 28+25 (LT. & RT.)	1907												
AU6	DBS 24+00 TO DBS 24+94 (23' RT.)				100									
SHEET TOTAL		25517	930	4	350									
PROJECT TOTAL		25517	930	4	350									
DESIGNED BY	D. PHILPOTT	04/07/02	REGION NO.	10	STATE	WASH	FED. AID PROJ. NO.						SR 8	QT 1
ENTERED BY	J. MCOTOLF	04/07/02	JOB NUMBER						McCLEARY INTERCHANGE					SHEET
CHECKED BY	M. HOFFMAN	04/07/02	CONTRACT NO.						QUANTITY TABULATION - REMOVAL ITEMS					10
PROJ. ENGR.	K. WILLIAMS	04/07/02											OF	
REGION ADM.	R. HAIN	04/07/02											117	
DATE	DATE	REVISION	BY											SHEETS

The following types of items will normally appear on quantity tabulation sheets:

- Preparation / Removal items
- Grading / Earthwork (If no profile sheets)
- Drainage (If no Structure Notes)
- Structure / Concrete Items
- Paving items / Approaches Erosion Control / Planting items (if Tabulated)
- Traffic Items
- Guardrail / Barrier
- Temporary Traffic Control Devices

Remember that some things such as guardrail come in designated lengths.

- ✓ Measured and paid by linear foot
 - 10' or 12.5' sections Adjust length to full sections
- ✓ Total & round per PPM 460.04
 - Measured and paid by unit (per each)
 - Guardrail end treatments,
 - Transition sections & Impact attenuators

Structure Notes

Structure note sheets are used to tabulate locations, bid items, quantities, and notes pertaining to the _____, _____, _____

STRUCTURE NOTES														
NOTE: THE FIRST NUMBER OF THE "CODE DESIGNATION" BELOW REFERS TO THE SHEET NO. OR THE SHEET REFERENCE NO. SHOWING THE DRAINAGE FEATURE. THE SECOND NUMBER REFERS TO THE DRAINAGE FEATURE FOUND ON THAT SHEET.										GENERAL NOTES:				
CODE	LOCATION	UNIT OF MEASURE	CONCRETE POLYMER CONCRETE STORM SEWER PIPE 12 IN. DIA.	SHAVE BACKFILL FOR WALL	PLASTIC DRAINAGE MARKING	STRUCTURE EXCAVATION CLASS B INCL. HAIL	SHOULDER OR EXTRA EXCAVATION CLASS B	SHAVE BACKFILL FOR DRAIN	PLUGGING EXISTING PIPE	CONSTRUCTION GEOTEXTILE FOR DITCH LINING	SEE GENERAL NOTES			
D2-1	D86 17+00 (18.5' LT) to 18.5' RT	36									1.4	1. SEE STANDARD PLAN A-4		
D2-2	D86 16+00 (18.5' LT) to 17+00 (18.5' LT)	100									1.4	2. SEE STANDARD PLAN B-1		
D2-3	D86 21+30 (20' LT) to 20' RT										9	3. SEE STANDARD PLAN B-1		
D2-4	D86 21+80 (110' LT)										5.10	4. SEE STANDARD PLAN B-4B		
D2-5	SFR 60+50 (52' LT)										4.12.16	5. SEE STANDARD PLAN B-7A		
D2-6	D86 23+00 (89' LT) to 23+50 (88' LT)										15	6. SEE "SPILLWAY DETAIL A," SHEET 001		
D2-7	D86 23+50 (88' LT) to 24+57 (82' LT)										3.13.14.15.16	7. SEE "SPILLWAY DETAIL B," SHEET 001		
D2-8	SFR 64+17 (99' RT) to 65+44 (105' RT)										17	8. REPLACE EXISTING CATCH BASIN WITH GRATE INLET TYPE 1.		
D2-9	WAS 10+15.5 (51.2' RT) to 10+25 (50.0' RT)										4.5.12.15	9. REMOVE EXISTING CULVERT.		
D2-10	SFR 65+44 (105' RT) to 65+90 (120' RT)										4.5.12.15	10. SEE "CULVERT ENTRY (118)" DRAINAGE DETAILS, SHEET 002		
D2-11	D86 21+50 (79.5' LT) to 21+90 (81' LT)										4.5.12.15	11. SEE "REINFORCE DETAIL," SHEET 002		
D2-12	D86 21+90 (81' LT) to 22+07 (89' LT)										8	12. SEE "SHOULDER SPALL LINED PIPE OUTLET DETAIL," SHEET 001		
D2-13	D86 21+26 (51' RT) to 61' LT										8	13. SEE "STANDARD TREATMENT DETAILS," SHEETS 013, 012, and 011		
D2-14	D86 17+34 (53' RT) to 53' LT										9	14. SEE DIVISION 7 OF THE SPECIAL PROVISIONS.		
D2-15	SFR 60+37 (89' RT) to 64+17 (99' RT)										11	15. CONDUIT ZONE III, INSTALLATION OF METAL STORM DRAINERS MUST BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 8-05.		
D3-1	EAS 15+00 (26' LT) to 44.9' RT										3.13.14.15.16	16. INSTALL MANHOLE RING AND COVER MARKED "DRAIN." SEE STANDARD PLAN B-25, TYPE 1.		
D3-2	NS-W 13+55 (26.8' LT) to 51.9' RT										5.12.15	17. SEE "DRAINAGE DETAILS," BRIDGE SHEETS A AND 14.		
D3-3	NS-E 16+00 (33.2' LT) to 45.9' RT										5.12.15	18. CLEAN OUT EXISTING CULVERT.		
D3-4	WAS 13+00 (17.2' LT) to 43.9' RT										7			
D3-5	SFR 71+49 (65' RT)										7			
D3-6	SFR 70+10 (100' LT)										20			
D3-7	SFR 70+10 (90' RT)										20			
D3-8	SFR 73+24 (5.5' RT) to 77+72 (5.5' RT)										20			
D3-9	SFR 70+32 (83.2' LT) to 71+91 (150' LT)										20			
D3-10	NS-W 15+12 (124.7' RT) to 16+00 (60.5' RT)										20			
D3-11	NS-W 15+42.5 (188.7' RT) to 15+99.5 (209.0' RT)										20			
D3-12	NS-W 11+25 (RT)										20			
D5-1	MC-N 11+00 (54.2' LT) to 51.9' RT										20			
D5-2	D86 16+00 (18.5' LT) to 28.5' LT										20			
D5-3	D86 12+75 (51' LT) to 41' RT										20			
D5-4	MC-N 12+30 (80' LT) to 5' RT										20			
D5-5	MC-N 15+36 (20' RT) to 14+91 (54.2' RT)										20			
D5-6	MC-N 12+75 (50' RT) to 13+37.8 (135.4' RT)										20			
D5-7	D86 14+37 (20' to 50' RT)										20			
D5-8	MC-N 17+18.5 (29' to 40' LT)										20			
D6-1	D86 27+80 (35' LT) to 34.2' RT										20			
D6-2	MC-S 10+80 (51.8' LT) to 40.3' RT										20			
D6-3	D86 24+57 (20' LT) to 65' LT										20			
D6-4	D86 24+00 (135' LT) to 25+14 (85.3' LT)										20			
D6-5	D86 24+87.5 (RT)										20			
SHEET TOTAL			148			27	1740	6550	12	1	120			
PROJECT TOTAL			148			27	1740	6550	12	1	120			
DESIGNED BY		D. PHILLIPS	04/07/02	REGION NO.		10	STATE		WASH.	FED. AID PROJ. NO.				
ENTERED BY		J. METCALF	04/07/02	JOB NUMBER		010537	CONTRACT NO.			Washington State Department of Transportation		SR 8 McCLEARY INTERCHANGE		
CHECKED BY		M. HOFFMAN	04/07/02	BY						STRUCTURE NOTES		SN 2		
PROJ. ENGR.		K. WILLIAMS	04/07/02									SHEET 27 OF 117 SHEETS		
REGION ADM.		R. HAN	04/07/02											

For projects involving only a few drainage items at a few locations, the information may be provided on the plan sheets, in either a tabular form in data boxes, or placed in a location on the sheet with a leader line used to connect the information with the drainage feature.

Measuring Pipe Length

The length of culvert pipe or pipe arch will be the number of linear feet of completed installation measured along the invert.

***2008 Standard Specifications
Storm Sewers 7-02.4***

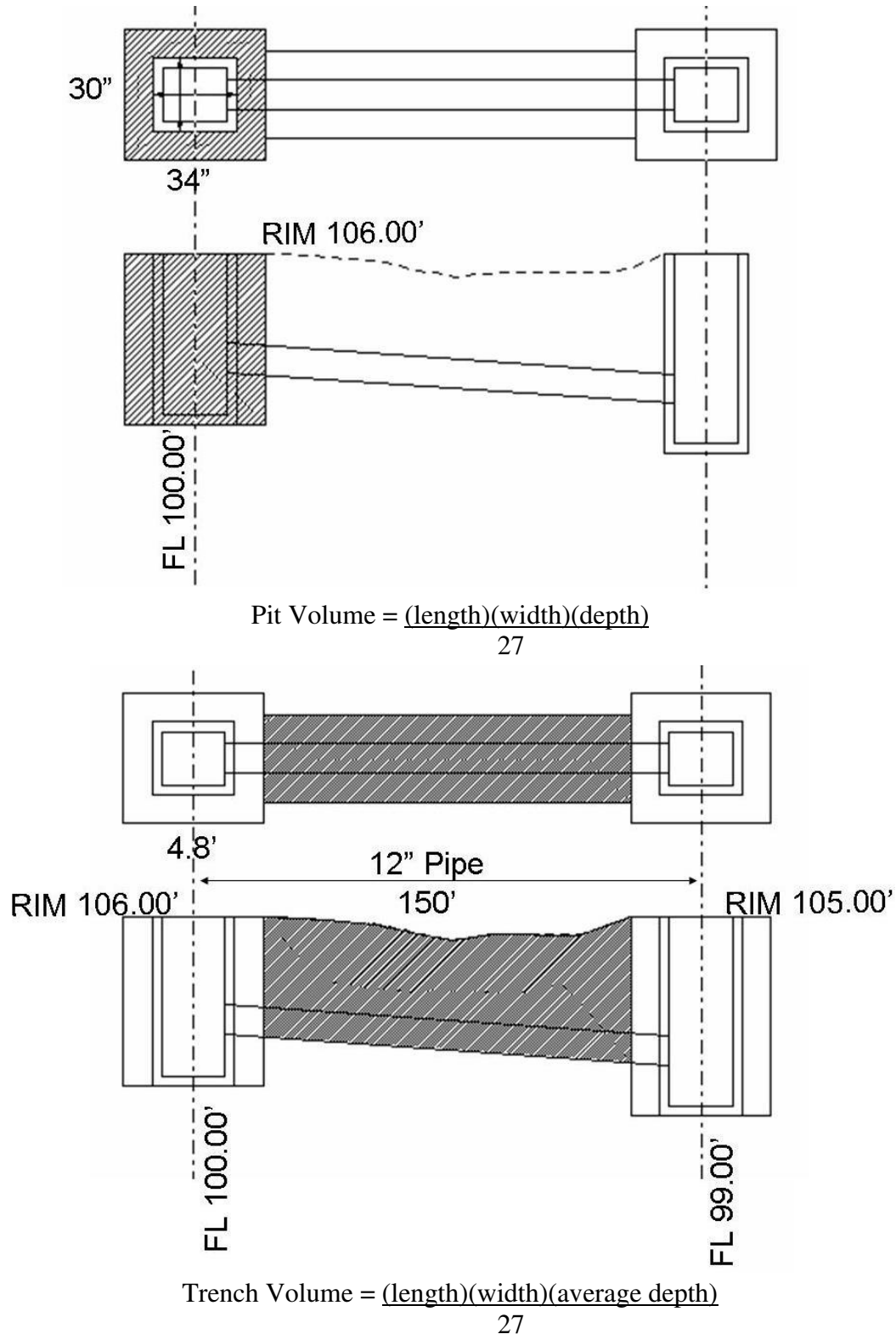


$$\text{Length} - 2(\text{Inside Diameter} / 2) = \text{Pipe Length}$$

The length of storm sewer pipe will be the number of linear feet of completed installation measured along the invert and will include the length through elbows, tees, and fittings. The number of linear feet will be measured from the center of manhole to center of manhole or to the inside face of catch basins and similar type structures.

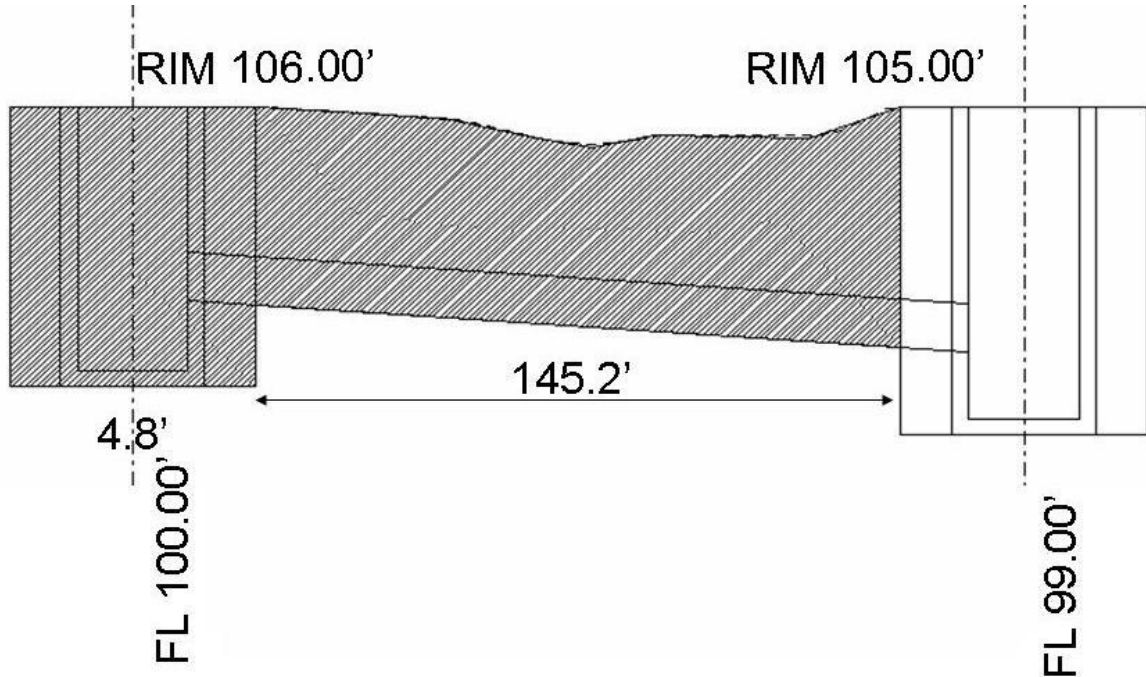
***2008 Standard Specifications
Storm Sewers 7-04.4***

Measuring Structure Excavation



See Standard Specification 2-09.4 for how structure excavation is measured.

Measuring Shoring & Cribbing or Extra Excavation



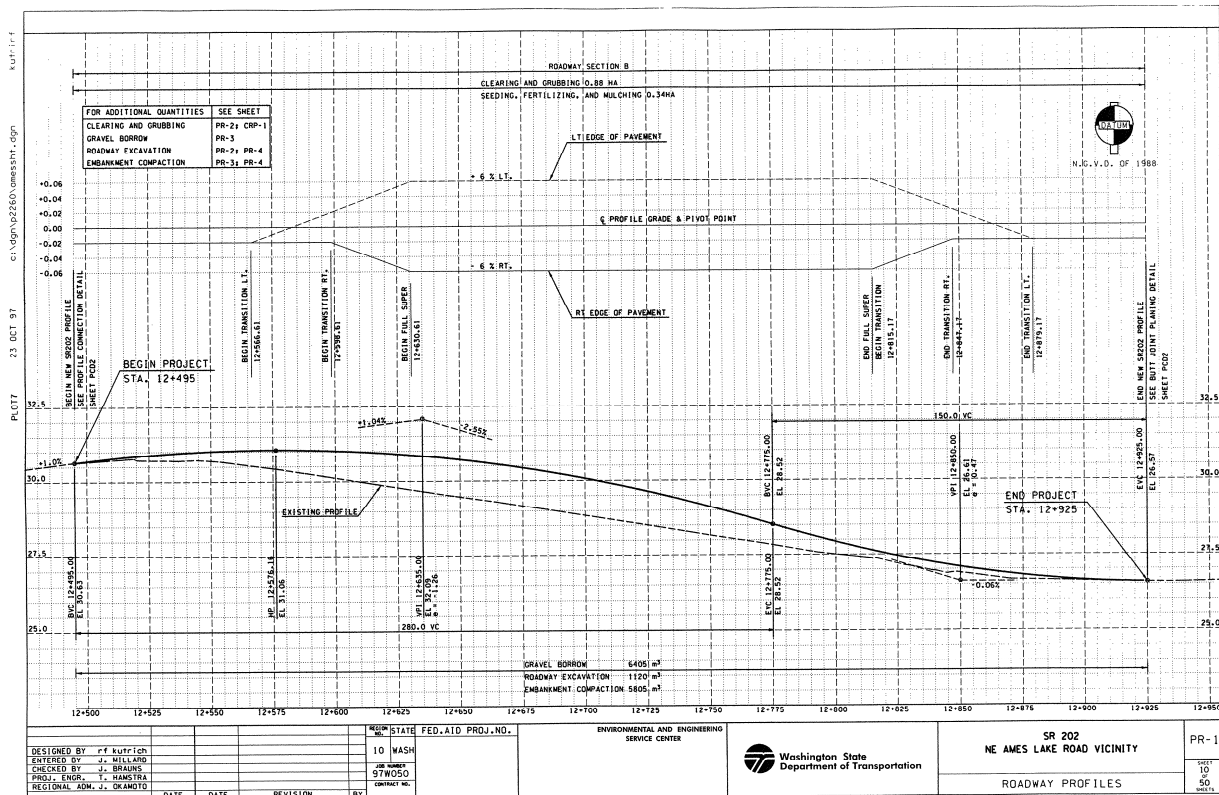
$$\text{Shoring Area} = (\text{Pit Length})(\text{Pit Depth}) + (\text{Trench Length})(\text{Trench Average Depth})$$

The area for payment will be one vertical plane measured along the centerline of the trench, including structures. Measurement will be made from the ground line to the bottom of the excavation and for the length of the work actually performed.

2008 Standard Specifications Storm Sewers 2-09.4

		Grate Inlet Type 1	Schedule A Storm Sewer Pipe 12 in.	Testing Storm Sewer Pipe	Structure Excavation Class B Incl. Haul	Shoring or Extra Excavation Class B
Code	Location	Each	LF	LF	CY	SF
D4-1	10+00 to 11+50 18' Rt.					

Profiles

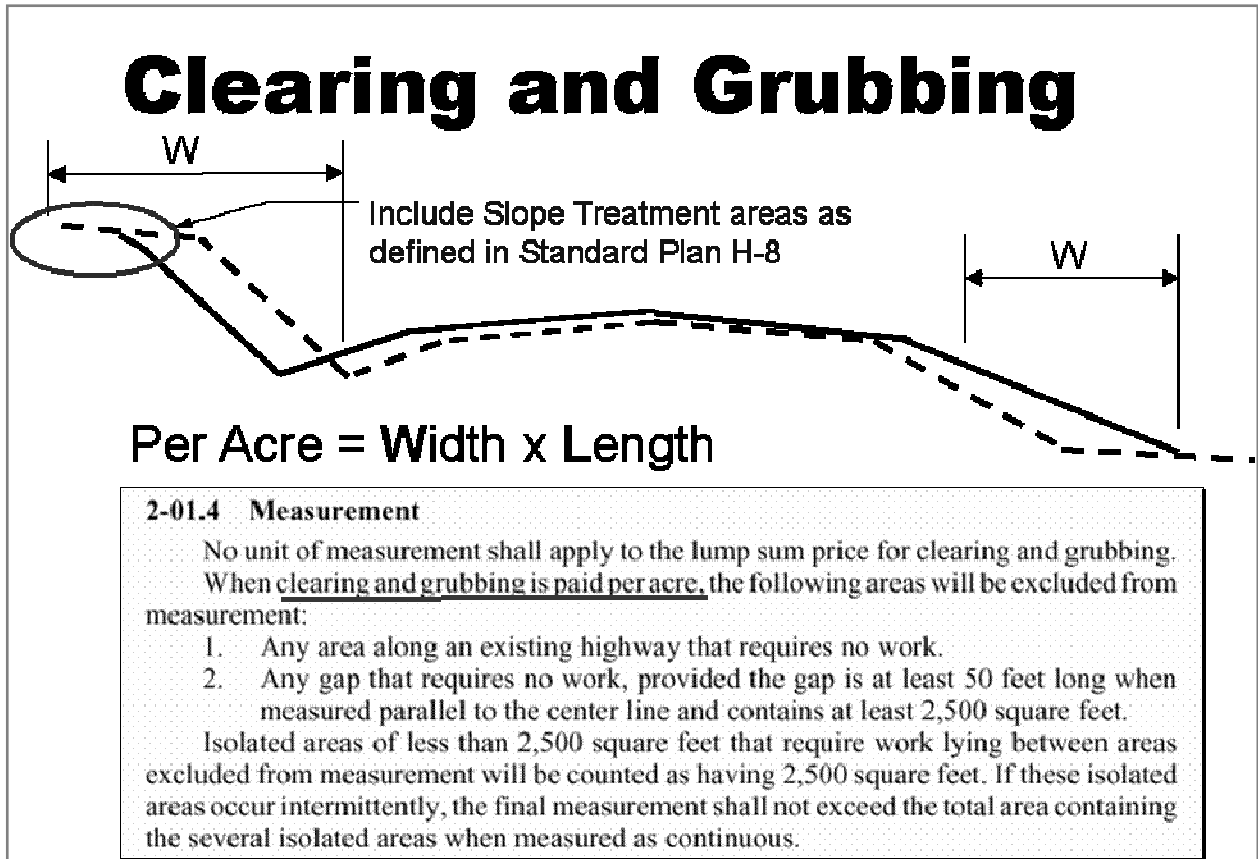


Quantities that are shown on the profile are:

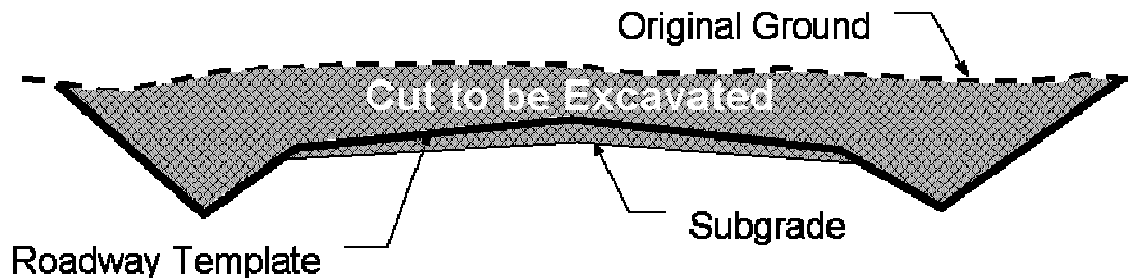
- ✓ Roadway Excavation
- ✓ Controlled blasting
- ✓ Vertical sand drains
- ✓ Unsuitable foundation excavation
- ✓ Toxic waste excavation
- ✓ Embankment Compaction
- ✓ Special backfill
- ✓ Clearing and Grubbing
- ✓ Seeding
- ✓ Compost
- ✓ Topsoil
- ✓ Fertilizing and mulching.

Areas of work or quantities will be shown, with arrows, between the station-to-station limits of the work, at 10 station (1000') totals if the work extends beyond 10 station totals, at other logical breaks, such as bridges or group breaks.

If these logical breaks are slightly more or than 1000 feet apart, it would be appropriate to have a 1300 foot total or a 700 foot total.



Roadway Excavation

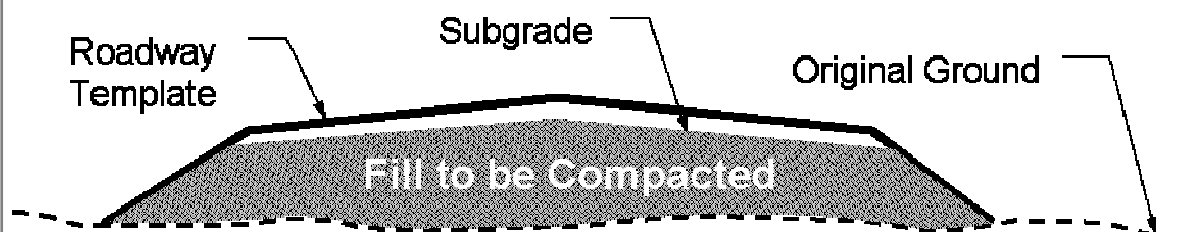


Per Cubic Yard = Width x Depth x Length

2-03.4 Measurement

“Roadway Excavation”, “Roadway Excavation Incl. Haul”, “Roadway Excavation – Area ____”, “Roadway Excavation Incl. Haul – Area ____” “Unsuitable Foundation Excavation”, and “Common Borrow Incl. Haul” will be measured by the cubic yard. All excavated material will be measured in the position it occupied before the excavation was performed. An original ground measurement will be taken using cross-section or digital terrain modeling survey techniques. For Roadway Excavation items, the original ground will be compared with the planned finished roadway section shown in the plans. Slope/ground intercept points defining the limits of the measurement will be as staked.

Embankment Compaction



Per Cubic Yard = Width x Depth x Length

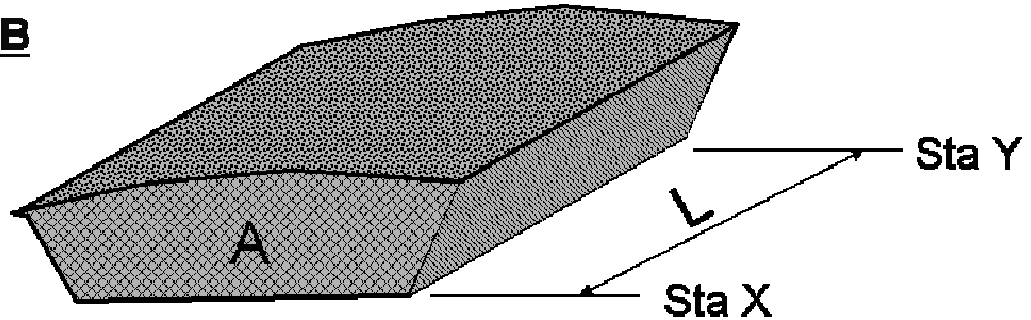
“Embankment Compaction” (Methods B and C in section 2-03.3(14)C) will be measured by the cubic yard. An original ground measurement will be taken using cross-section or digital terrain modeling survey techniques. Quantities will be determined based on a comparison of the original ground measurement with the finished embankment section as staked. No allowance will be made for material that settles. No deduction will be taken for other items constructed within the embankment (bridge abutments, piers, columns, backfill, pipes, etc.). The Contracting Agency will exclude

Volume Calculations by

Average End Area

1. Compute and Average 2 End Areas (ft²)

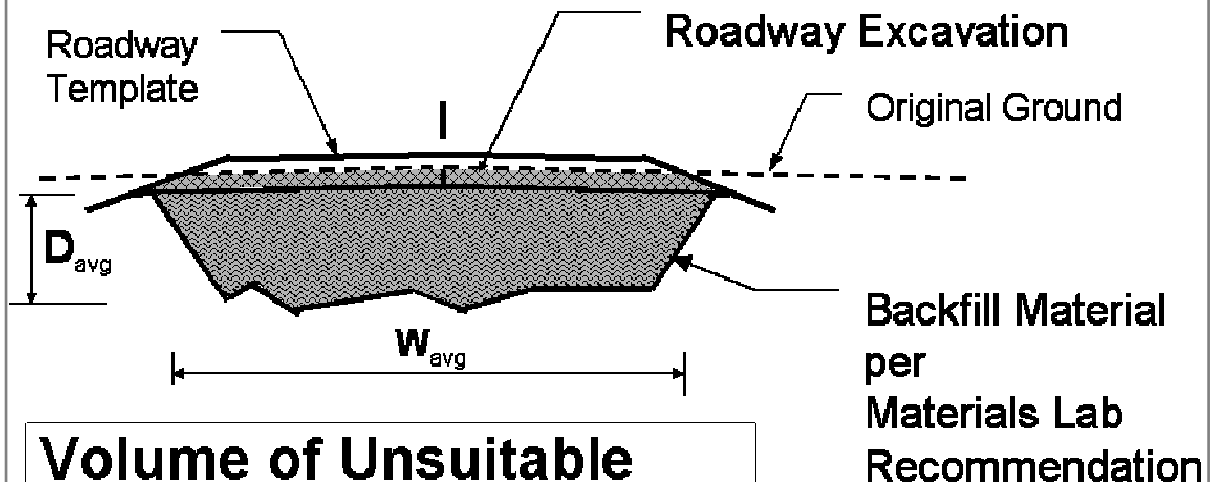
$$\frac{A + B}{2}$$



2. Multiply by Distance (ft) Between End Areas
3. Convert ft³ to yd³

$$\left[\frac{A + B}{2} \right] \times L \div 27 \Rightarrow \text{Volume in Cubic Yards}$$

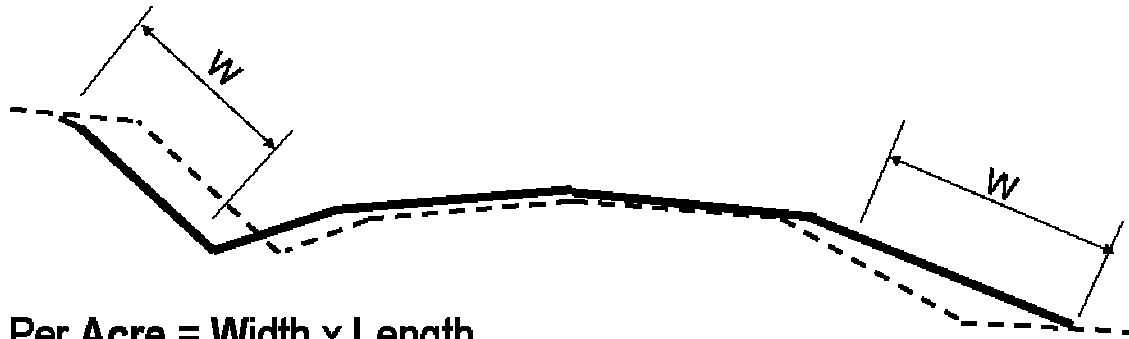
Unsuitable Foundation Excavation



Volume of Unsuitable

$$\text{Per Cubic Yard} = W_{\text{avg}} \times D_{\text{avg}} \times L_{\text{avg}}$$

Seeding, Fertilizing & Mulching



Per Acre = Width x Length

Seeding, fertilizing, liming, mulching, mowing, and soil binder or tacking agent will be measured in acres by ground slope measurement or through the use of design data.

Seeding and fertilizing by hand will be measured by the square yard. No adjustment in area size will be made for the vegetation free zone around each plant.

Drainage Quantities Exercise

Instructions

- Calculate the quantities for the following bid items using Structure Note KB7-8.
- The Bid Items include:
 - ✓ Catch Basin Type 1
 - ✓ Schedule A Storm Sewer Pipe 12 In. Diameter
 - ✓ Testing Storm Sewer Pipe
 - ✓ Structure Excavation Class B Incl. Haul
 - ✓ Shoring or Extra Excavation Class B

Given:

- Plan Sheets KB7 & KC8
- Standard Plan B-1, B-1e

Code	Location					

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Adjustments to Surfacing Quantities

Adjustment # 1 – Low Subgrade

The old (metric) Construction Manual and the new Highway Survey Manual directs the surveyors to hub the subgrade blue tops at 0.00' to 0.05' below subgrade elevation. On the average, subgrades are built 0.03' below finished subgrade and the difference is made up with base rock material. This causes the base rock material to be overrun, during construction.

To prevent the overrun during the design phase: Add 0.03' to the base rock depth and divide it by the original depth to get a multiplication factor. DO NOT make adjustments to the depths of the CAiCE fragments to obtain quantity! By adjusting depths there is a risk that the wrong files could be used to obtain the subgrade staking report thus causing the subgrade to be staked low.

EXAMPLE:

Crushed Surfacing Base Course (CSBC) - depth of 0.40'.

Use $0.43'/0.40' = 1.075$ factor for a 7.5% increase. Multiply neat line quantities from CAiCE or hand calculations by 1.075.

Adjustment # 2 – Material pushed into subgrade

To compensate for the surfacing material that is compressed or keyed into the subgrade material:

- Increase the quantity 5% if you predict the subgrade will be hard and fairly unyielding
- Increase the quantity 10% if you predicted the subgrade material is rocky and/or open graded.

In other words, increase the base rock material on your project 5% to 10% depending on your subgrade material because of keying.

Adjustment # 3 – Material pushed into bottom layer of surfacing

The amount of surfacing material that is keyed into an underling surfacing material with a different gradation will vary with the difference in gradation of the two materials.

- On normal CSTC over CSBC this would amount to a 5% increase in the CSTC quantity.
- If CSTC was going over a more open graded ballast type material, then CSTC should be increased by 10%.

Adjustment #4 - All aggregate quantities measured by weight

Another adjustment to pay close attention to is the specific gravity of material. The WSDOT Design Manual provides weight per cu. yd for various crushed material. Some quarries vary from this as much as 10%.

Estimating table weights are based on dry aggregate. Corrections are required for water contents.

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The Engineer's Estimate

An engineer's estimate for a project is typically passed on from its original conception all the way to the opening of bids for a project. As an engineer's estimate is developed from a project definition estimate to a "L" job estimate and on to a PS&E job number; it may be renamed several times during the process.

Please insure that you are working with only the latest version of an estimate. It will do the designer no good to be changing a "L" number estimate when the project estimate has already been renamed and assigned a PS&E job number (e.g. 98W604)

EBASE Reports

The region enters contract estimates into the Estimate and Bid Analysis System (Ebase). A job number unique to each project identifies the estimate for each contract. The same job number used to identify the contract provisions should be used to identify the estimate.

- ✓ Proposal (which is included in the _____)
- ✓ Preliminary Estimate (information used by _____)
 - Summary
 - Fund
 - By Group
 - By Item
 - Work Classification
- ✓ Summary of Quantities (which is included in the _____)

Remember to destroy all Sensitive Material not required for your records!

By Item Report

PS&E JOB NO: 042013		WASHINGTON STATE DEPARTMENT OF TRANSPORTATION			DATE: 02/08/2005		PAGE: 1
CONTRACT NO: 006907		ESTIMATES AND BIDS ANALYSIS SYSTEM			TIME: 07:55		VER: 1
WORK ORDER : XL1629		*** PRELIMINARY ESTIMATE - BY ITEM ***			DOT-RGG100		
ITEM NO.	STD. NO.	ITEM DESCRIPTION	UNIT MEAS	UNIT PRICE	QUANTITY	AMOUNT	PRE QUA
PREPARATION							
1	0001	MOBILIZATION	L.S.			120,000.00	A1
2	0035	CLEARING AND GRUBBING	L.S.			17,000.00	D6
3	0049	REMOVING DRAINAGE STRUCTURE	EACH	450.00	1.00	450.00	G2
4	0145	REMOVING CONC. BARRIER	L.F.	5.00	6,540.00	32,700.00	N0
5	0170	REMOVING GUARDRAIL	L.F.	2.00	987.00	1,974.00	K2
6	0182	REMOVING GUARDRAIL ANCHOR	EACH	175.00	26.00	4,550.00	K2
7	0185	REMOVING GUIDE POST	EACH	2.50	641.00	1,602.50	K6
8	0188	REMOVING TEMPORARY PAVEMENT MARKING	L.F.	0.05	120,477.00	6,023.85	Q2
9		REMOVING MONUMENT CASE AND COVER	EACH	200.00	1.00	200.00	O4
GRADING							

This report makes available each item along with its respective planned quantity, unit price and total estimated amount.

What is the suggested percentage for Mobilization for a \$1 million project? _____

Funds Report

PS&E JOB NO: 042013	WASHINGTON STATE DEPARTMENT OF TRANSPORTATION	
CONTRACT NO: 006907	ESTIMATES AND BIDS ANALYSIS SYSTEM	
WORK ORDER NO: XL1629	* * * PRELIMINARY ESTIMATE - FUND REPORT * * *	
	Fund 1	
	FEDERAL	TOTAL
	IM-0905(098)	
	(1) 100.00%	
BASE CONTRACT TOTAL	2,121,950.22	2,121,950.22
WASHINGTON STATE SALES TAX 7.60%	2,932.32	2,932.32
OF \$38,583.15		
WASHINGTON STATE SALES TAX 7.80%	162,502.63	162,502.63
OF \$2,083,367.07		
700 - ONE TIME CONNECTION FEE FOR SG 410	5,130.00	5,130.00
BASE PROJECT SUBTOTAL	2,292,515.17	2,292,515.17
ENGINEERING 12.00%	275,101.82	275,101.82
CONTINGENCIES 4.00%	91,700.61	91,700.61
BASE PROJECT TOTAL	2,659,317.60	2,659,317.60
FEDERAL FUNDS		
(1) SEE GROUPS 1, 2, 3, 4		

This report shows the breakdown of participation summarized by federal-aid participating or non- participating and by fund name. Additional pages of this report will be produced for each alternate combination.

What are the engineering and contingency percentages for a P1 paver that is over \$1 million?

Are contingencies always 4%? _____

Engineer's Estimate

- Internal and external plan-holders use the Summary of Quantities to grasp the nature and magnitude of the work.
- Program Managers use Preliminary Estimates to monitor and balance the overall WSDOT Program.
- Contract Ad & Award uses Work Classification Reports to determine which contractors are eligible to bid on specific contracts.
- Accounting uses the Preliminary Estimates to set up construction phase Work Orders (aka Contract #s).
- Pre-qualified Contractors submit their bids on the Proposal Form.
- Contract Ad & Award identifies the low bid by comparing bids received on the Proposal Forms against the Preliminary Estimate.
- Project Offices compare bids in the Bid Check Report against the By Item Report to justify award or rejection of bids over 10% or \$50K.

Summary of Quantities

SUMMARY OF QUANTITIES															DOT 806009 5/26/2006	
ITEM NO.	QUANTITY	UNIT	DESCRIPTION	GROUP 1	GROUP 2	GROUP 3	GROUP 4	GROUP 5	GROUP 6	GROUP 7	GROUP 8	GROUP 9	GROUP 10	GROUP 11	GROUP 12	GROUP 13
1	1.00	CU YD	EXCAVATION													
2	1.00	CU YD	EXCAVATION													
3	1.00	CU YD	EXCAVATION													
4	1.00	CU YD	EXCAVATION													
5	1.00	CU YD	EXCAVATION													
6	1.00	CU YD	EXCAVATION													
7	1.00	CU YD	EXCAVATION													
8	1.00	CU YD	EXCAVATION													
9	1.00	CU YD	EXCAVATION													
10	1.00	CU YD	EXCAVATION													
11	1.00	CU YD	EXCAVATION													
12	1.00	CU YD	EXCAVATION													
13	1.00	CU YD	EXCAVATION													
14	1.00	CU YD	EXCAVATION													
15	1.00	CU YD	EXCAVATION													
16	1.00	CU YD	EXCAVATION													
17	1.00	CU YD	EXCAVATION													
18	1.00	CU YD	EXCAVATION													
19	1.00	CU YD	EXCAVATION													
20	1.00	CU YD	EXCAVATION													
21	1.00	CU YD	EXCAVATION													
22	1.00	CU YD	EXCAVATION													
23	1.00	CU YD	EXCAVATION													
24	1.00	CU YD	EXCAVATION													
25	1.00	CU YD	EXCAVATION													
26	1.00	CU YD	EXCAVATION													
27	1.00	CU YD	EXCAVATION													
28	1.00	CU YD	EXCAVATION													
29	1.00	CU YD	EXCAVATION													
30	1.00	CU YD	EXCAVATION													
31	1.00	CU YD	EXCAVATION													
32	1.00	CU YD	EXCAVATION													
33	1.00	CU YD	EXCAVATION													
34	1.00	CU YD	EXCAVATION													
35	1.00	CU YD	EXCAVATION													
36	1.00	CU YD	EXCAVATION													
37	1.00	CU YD	EXCAVATION													
38	1.00	CU YD	EXCAVATION													
39	1.00	CU YD	EXCAVATION													
40	1.00	CU YD	EXCAVATION													
41	1.00	CU YD	EXCAVATION													
42	1.00	CU YD	EXCAVATION													
43	1.00	CU YD	EXCAVATION													
44	1.00	CU YD	EXCAVATION													
45	1.00	CU YD	EXCAVATION													
46	1.00	CU YD	EXCAVATION													
47	1.00	CU YD	EXCAVATION													
48	1.00	CU YD	EXCAVATION													
49	1.00	CU YD	EXCAVATION													
50	1.00	CU YD	EXCAVATION													
51	1.00	CU YD	EXCAVATION													
52	1.00	CU YD	EXCAVATION													
53	1.00	CU YD	EXCAVATION													
54	1.00	CU YD	EXCAVATION													
55	1.00	CU YD	EXCAVATION													
56	1.00	CU YD	EXCAVATION													
57	1.00	CU YD	EXCAVATION													
58	1.00	CU YD	EXCAVATION													
59	1.00	CU YD	EXCAVATION													
60	1.00	CU YD	EXCAVATION													
61	1.00	CU YD	EXCAVATION													
62	1.00	CU YD	EXCAVATION													
63	1.00	CU YD	EXCAVATION													
64	1.00	CU YD	EXCAVATION													
65	1.00	CU YD	EXCAVATION													
66	1.00	CU YD	EXCAVATION													
67	1.00	CU YD	EXCAVATION													
68	1.00	CU YD	EXCAVATION													
69	1.00	CU YD	EXCAVATION													
70	1.00	CU YD	EXCAVATION													
71	1.00	CU YD	EXCAVATION													
72	1.00	CU YD	EXCAVATION													
73	1.00	CU YD	EXCAVATION													
74	1.00	CU YD	EXCAVATION													
75	1.00	CU YD	EXCAVATION													
76	1.00	CU YD	EXCAVATION													
77	1.00	CU YD	EXCAVATION													
78	1.00	CU YD	EXCAVATION													
79	1.00	CU YD	EXCAVATION													
80	1.00	CU YD	EXCAVATION													
81	1.00	CU YD	EXCAVATION													
82	1.00	CU YD	EXCAVATION													
83	1.00	CU YD	EXCAVATION													
84	1.00	CU YD	EXCAVATION													
85	1.00	CU YD	EXCAVATION													
86	1.00	CU YD	EXCAVATION													
87	1.00	CU YD	EXCAVATION													
88	1.00	CU YD	EXCAVATION													
89	1.00	CU YD	EXCAVATION													
90	1.00	CU YD	EXCAVATION													
91	1.00	CU YD	EXCAVATION													
92	1.00	CU YD	EXCAVATION													
93	1.00	CU YD	EXCAVATION													
94	1.00	CU YD	EXCAVATION													
95	1.00	CU YD	EXCAVATION													
96	1.00	CU YD	EXCAVATION													
97	1.00	CU YD	EXCAVATION													
98	1.00	CU YD	EXCAVATION													
99	1.00	CU YD	EXCAVATION													
100	1.00	CU YD	EXCAVATION													

The Summary of Quantities sheet provides a complete tabulation of all bid items and pay quantities that have been determined by the designer/design team to be required for the project. Bid items and quantities are entered into the project estimate via EBASE (Estimate Bid Analysis System). The Summary of Quantities plan sheet is generated from the estimate database by requesting a summary of quantities plot.

Plans

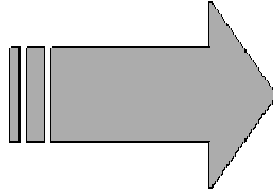
Profiles

Q-Tabs

Structure
Notes

Misc
Qtys

Where Contract Bid Items Come From



Non-tabulated Qtys
Tables in Plans
Lump Sum Items
Estimated Items
Calculated Items

EBASE

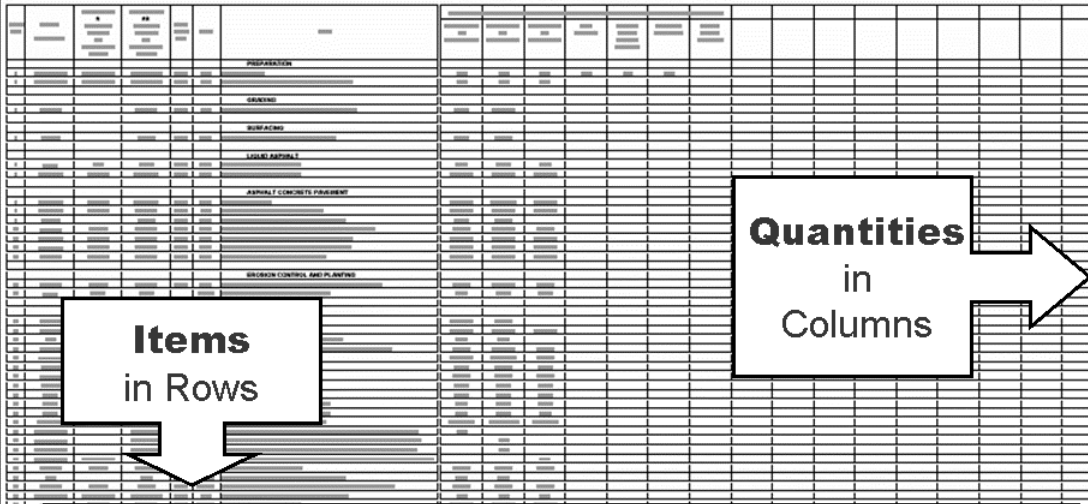
Summary
of Qtys

+

Proposal

SUMMARY OF QUANTITIES

DOT_R06900
3/28/2001



Items
in Rows

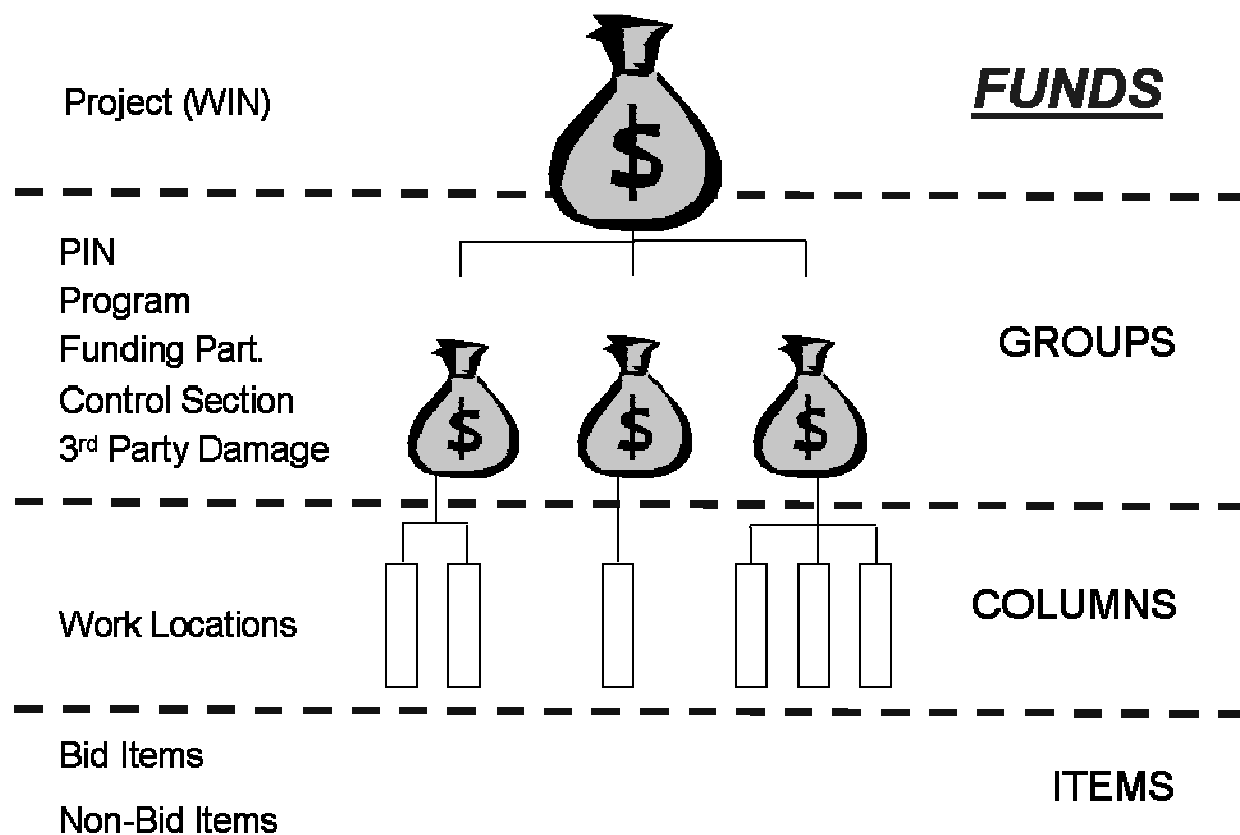
Quantities
in
Columns

- **Complete tabulation** of all **bid items** and **pay quantities** for project
- Generated by EBASE

Items that appear on the Summary of Quantities only:

- ✓ Lump Sum Items
- ✓ Force Account Items
- ✓ Water
- ✓ Aeration Items
- ✓ Structure Items (bridges, walls, etc.)
- ✓ Borrow materials
- ✓ Surfacing materials
- ✓ Paving materials
- ✓ Top soil
- ✓ Sign covering
- ✓ Traffic Control items

Funds, Groups & Columns



Funds

There are many sources of Construction funds

Private = _____

Local = _____

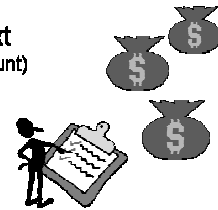
Federal = _____

State = _____

How multi-participant funds are disbursed

Sequence fund expenditure in this **order**:

1. **Private \$\$** - spend first
(often a maximum amount)
2. **Local \$\$** - spend next
(sometimes a maximum amount)
3. **Federal \$\$** - next
(generally a percentage)
4. **State \$\$** - last
(always 100%)



Groups

GROUP 1	GROUP 1	GROUP 2	GROUP 3	GROUP 4	GROUP 5	GROUP 6
STA 351+27 TO STA 367+87	STA 392+09 TO STA 463+48	STA 507+60 TO STA 526+36	PSE SNO CO	ALDER- WOOD WATER SNO CO	VERIZON EVERETT	THIRD PARTY DAMAGE

The Summary of Quantities shall be divided into groups, and columns within the groups. A separate group is required for the following:

- ✓ Whenever there is a change in program item number (PIN).
- ✓ Whenever there is a change in program or subprogram (I2, P1, P2, etc.).
- ✓ Whenever there is a change in funding (any change in funding participants, their individual participation rates, or their source of funding). Funding participants may be the FHWA, a state agency, county, city, other public agencies, private organizations, and participation agreements for work to be done by the contractor.
- ✓ Whenever there is a change in control section.
- ✓ A separate state funded group (one per project) is required for third party damages. The bid item "Reimbursement for Third Party Damage", is to be included in this group.

Columns

Each group is required to have at least one column associated with it. Additional columns within a group are required for the following:

- ✓ Each bridge and wall shall have its own column in order to identify materials quantities required to construct this item.
- ✓ Each state furnished pit site (mandatory or not) shall have its own column.
- ✓ Mainline, ramps, frontage roads, walls, etc.

Items

SUMMARY OF QUANTITIES

ITEM	GROUP 1	GROUP 1	GROUP 1	GROUP 1	GROUP 1	GROUP 1	GROUP 1
	SR77 49+00.00 TO 70+85.00	DBE LINE 9+00.00 TO 29+85.00	MC-N LINE 10+00.00 TO 17+18.64	MC-S LINE 10+00.00 TO 13+59.55	W-NS LINE 10+00.00 TO 17+74.53	NS-W LINE 9+00.00 TO 18+19.15	BRIDG NO. 77/1
PREPARATION							
MOBILIZATION	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.	L.S.
CLEARING AND GRUBBING	0.90	4.20	1.00	0.40	1.20	1.00	
REMOVING DRAINAGE STRUCTURE	1.00	5.00					
REMOVING ASPHALT CONC. PAVEMENT	5,679.00	3,057.00	5,219.00	2,238.00	221.00		
REMOVING GUARDRAIL			580.00			170.00	
REMOVING GUARDRAIL ANCHOR			2.00			1.00	
REMOVING MISCELLANEOUS TRAFFIC ITEM	L.S.	L.S.	L.S.	L.S.			
REMOVING WIRE FENCE		150.00			200.00		

There are two types of bid items:

_____ which is work performed by the Contractor

_____ which is material or work charged to the contract but ***not*** furnished or performed by Contractor.

Summary of Quantities Exercise

Instructions

Complete the backup data and the Summary of Quantities on the attached sheet.

With the following information, determine how many “Groups” will be needed and how many “Columns” will be needed for each Group.

- Determine the proper groups and columns
- Then calculate the quantities and costs for the various items for each column.
- Transfer the quantities to the Summary of Quantities.

Given

- Interstate 82 is a divided highway, LL line for SB traffic and the LR line for NB traffic.
- Bridge 82/142 is between MP 75.35 and MP 75.37 NB.
- Control Section CS391800 changes at MP 75.37 to CS030500
- Project Limits are from MP 71.36 to MP 77.73

Summary of Quantities

UNIT	ITEM	Group	Group	Group	Group	Group	Group
	Remove Traffic Arrows						
	Remove Raised Pavement Markers						
	Remove Guide Post						
	Remove Plastic Wide Line						
	Third Party Damage						

Backup Data

Calc. By/Date

Checked by/Date

Remove Traffic Arrows (EA)

					Quantities					
					Group	Group	Group	Group	Group	Group
Line	M.P.	NB/SB	Type	Quantity						
LR	71.61	NB	6R	1						
LR	71.64	NB	6R	1						

Item Cost = \$35/each

Calc. By/Date

Checked by/Date

Remove Raised Pavt. Markers (Hund)

					Quantities					
					Group	Group	Group	Group	Group	Group
Line	MP to MP		NB/SB	Quantity						
LR	71.40	71.45	NB	0.26						
LR	71.45	71.59	NB	0.55						
LR	71.45	75.35	NB	15.44						
LR	75.35	75.37	NB	0.08						
LR	75.40	77.73	NB	12.30						
LL	71.36	75.37	SB	15.88						
LL	71.47	71.57	SB	0.53						
LL	72.71	73.00	SB	1.53						
LL	73.00	75.30	SB	12.14						
LL	76.39	76.44	SB	0.26						

Item Cost = \$106/Hundred

Calc. By/Date

Checked by/Date

Remove Guide Post (Each)

					Quantities					
					Group	Group	Group	Group	Group	Group
Line	MP to MP		NB/SB	Quantity						
LR	71.45	75.35	NB	21						
LR	75.35	75.37	NB	4						
LR	75.37	77.73	NB	12						
LL	71.36	75.03	SB	19						
LL	75.03	75.37	SB	2						
LL	75.37	76.57	SB	6						
LL	76.57	77.09	SB	3						

Item Cost = \$10/each

Calc. By/Date

Checked by/Date

Remove Plastic Wide Line (LF)

					Quantities					
					Group	Group	Group	Group	Group	Group
Line	MP to MP		NB/SB	Quantity						
LR	72.71	72.79	NB	422						
LR	73.24	73.40	NB	845						
LR	76.49	76.56	NB	370						
LR	77.18	77.40	NB	1162						
LL	71.36	71.41	SB	264						
LL	72.77	72.94	SB	898						
LL	73.06	73.20	SB	739						
LL	73.35	73.42	SB	370						
LL	76.44	76.57	SB	686						
LL	77.05	77.09	SB	211						

Item Cost = \$10/LF

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Manage your Project

How do I keep things on track?

Within each project type, there are a series of deliverables, tasks, activities, and events necessary to successful delivery of the project. These tasks require the expertise of a wide variety of specialty work groups. A project team, in order to be effective, needs to take into account the knowledge, skills and abilities of each disciplinary group.

Project Management Process

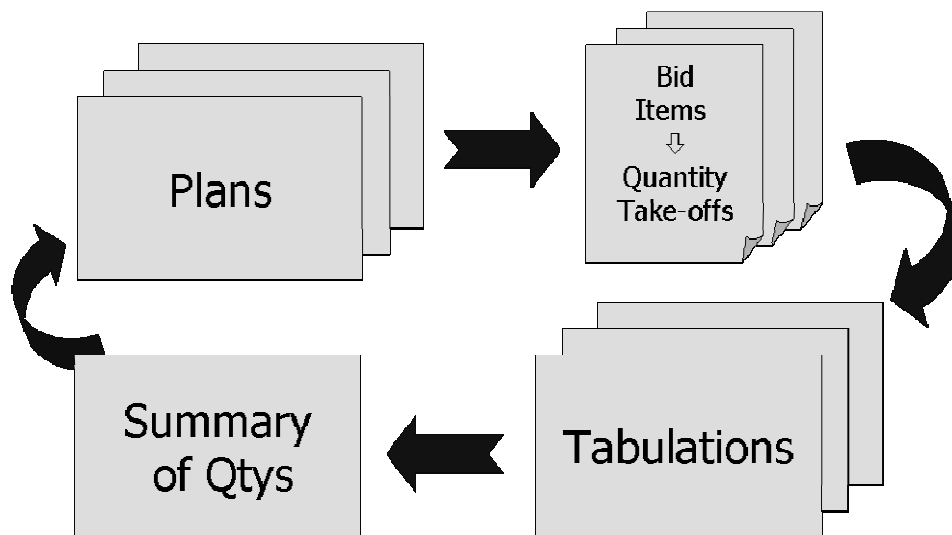
Use Project Management Process procedures and tools:

- ✓ Develop, endorse, and execute the project Work Plan
 - Quality Control Plan
 - Change Management Plan
- ✓ Ensure the PS&E is in accordance with:
 - Approved Design Documentation Package
 - Plans Preparation Manual
 - Endorsed Work Plan
- ✓ Actively manage
 - Scope, Schedule and Budget
- ✓ Facilitate Communication
 - Coordinate PS&E preparation
 - Ensure Region & HQ reviews have been completed.
 - Incorporate revisions
- ✓ Learn and improve

Quality Control

- ✓ Conduct quality checks to assure coordination throughout PS&E:
 - Contract Plans
 - Engineer's Estimate
 - Contract Provisions

Preparation Sequence



Assembling the Plan Package

- ✓ Integrate plans prepared by Others with plans prepared in the Project Office
- ✓ Sequence plans in accordance with PPM 460.01

Plan Reviews/Ad & Award

PS&E to Region

- ✓ Finalize Index; number sheets
- ✓ Initiate review via submittal to Region with Transmittal Memo (Samples – PPM A3)

Pre-Ad Reviews

- ✓ Conducted by Region Plans Office (aka Plan Review, PS&E Review) prior to Advertisement
 - Comment and response period
 - May include a meeting
 - Is project Biddable?

Ad-Ready Plan Package

- ✓ Incorporates all appropriate changes resulting from the review process
- ✓ Certified in accordance with Executive Order E1010.00

Ad & Award

Bid period revisions

If:

- ✓ Quantities change
- ✓ Items added or deleted

Issue revised:

- ✓ Proposal
- ✓ Summary of Quantities

Very good guidance on Addendum preparation is provided in **Appendix 5** of the PPM.

Changes are to be of a significant enough magnitude to warrant processing the addendum and need to be concurred with before you begin the process. **Unit price items: Quantity changes up to 25% of the original bid quantity will be paid at the unit contract (bid price) and is NO REASON to issue an addendum.**

Evaluating Bids Over 10% (or \$50K)

- **Region recommends award or rejection**
(See Appendix 7 Ad and Award Manual)

Bid Opening Today

Some contracts include work to be done for other parties, such as a city, county, etc.

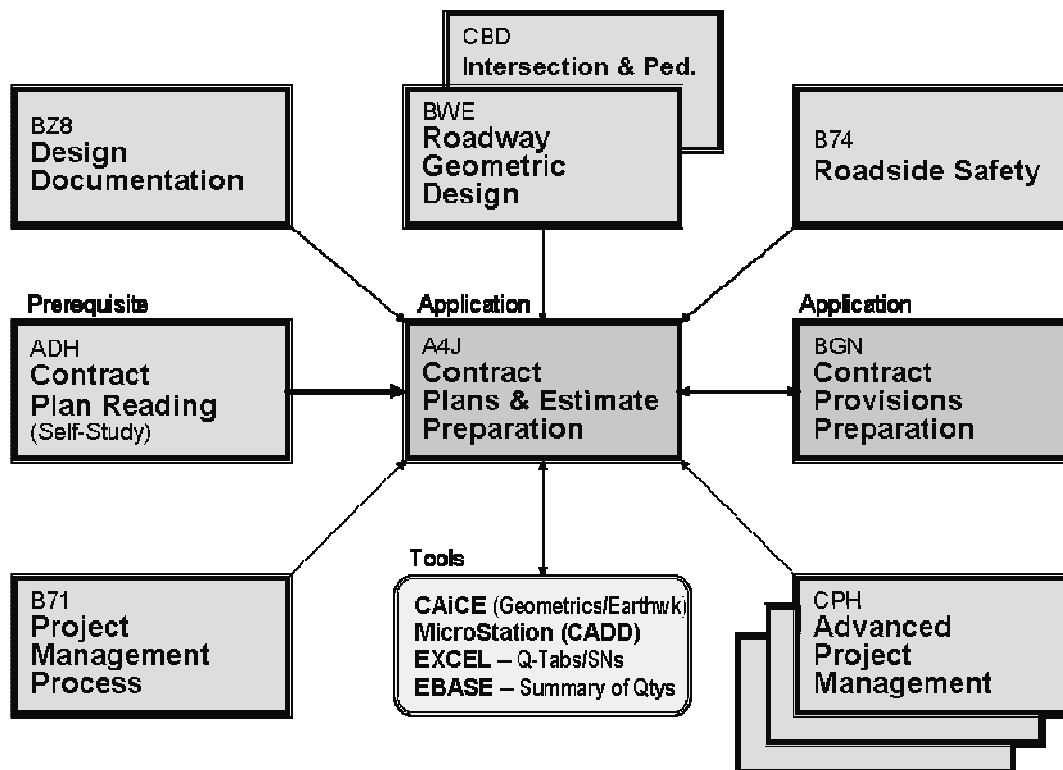
Since they frequently have very limited resources, the agreement to do the work for them may contain an out clause, in case the bids come in too high.

In that case, we need to obtain concurrence from the other party before awarding the contract, or delete the work that was to be done for them.

Design Documentation

- ✓ Back up calculations
- ✓ Agreements (Funding, Bid & Non-Bid Items)
- ✓ Engineer's Estimate:
 - Ad Version
 - Addenda Version(s)
 - Bid Check Report (Bid Opening)
 - Bid Tabulation (later)
- ✓ Justification to award or reject

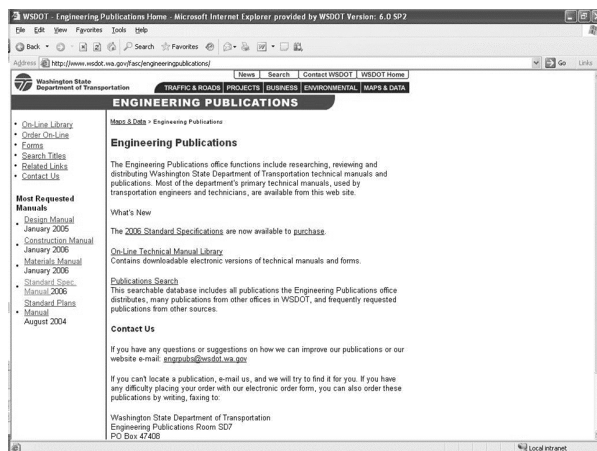
Training



- ✓ Team Leader
- ✓ Asst PE and PE
- ✓ Other Designers

- ✓ Plan Reviewer
(Anytime during design phase)
- ✓ Other Designers
- ✓ Subject Matter Experts
(Traffic, Landscape, Hydraulics,
etc.)

Design Guidance and Other Resources



Design guidance is available in various formats. Hard copy (manuals) and electronically on the internet, and on CD.

Designers are encouraged to use the on-line manuals, as they (generally) reflect changes right after they happen. Distribution of hard copies lag behind and you may look at a manual that has not received a particular update.

DESIGNERS ARE ALWAYS RESPONSIBLE TO USE THE CURRENT DESIGN GUIDANCE OR CRITERIA, NO MATTER WHAT FORM IT IS IN.

Old contract plans are a great resource.

Things that work in the past should still work, but make sure that it did.

[illegible]

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Course Objectives

Course Title: Contract Provision Preparation

Course Code: BGN

Date: _____

Location: _____

Instructor(s): _____

AFTER SUCCESSFUL COMPLETION OF THIS COURSE,
THE STUDENT WILL BE ABLE TO:

Use the Standard Specifications

Set up Contract Provisions selecting:

- Amendments
- Statewide General Special Provisions (GSPs)
- Region General Special Provisions (RGSPs)
- Project specific Special Provisions (SPs)

Create a project specific special provision

This course provides engineers and technicians with the knowledge and skills necessary to prepare provisions for WSDOT highway construction contracts. The focus will be on using WSDOT's Plans Preparation manual and Standard Specifications as references.

Manuals used:

WSDOT Plans Preparation Manual

WSDOT Standard Specifications

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Let's test your knowledge

1. Match the definitions found in Column B with the corresponding term found in Column A.

COLUMN A		COLUMN B	
_____	Addendum	A	A publication addressing the work required for an individual project which may include the amendments to the standard specifications, the special provisions, a listing of the applicable standard plans, the prevailing minimum hourly wage rates, and an informational proposal with a listing of the bid items.
_____	Contract Provisions	B	Revisions to the Standard Specifications that occur between printings of the Standard Specifications.
_____	Special Provisions	C	A manual of specifications adopted by the Contracting Agency that contains description, materials, construction, measurement, and payment requirements for standard items of road, bridge and municipal construction work.
_____	Amendments	D	Supplemental specifications and modifications to the Standard Specifications and the amendments to the Standard Specifications that apply to an individual project.
_____	Standard Specifications	E	A written or graphic document, issued to all bidders prior to the bid opening, which modifies or supplements the bid documents and becomes a part of the contract.

2. When a Standard Specifications payment statement has a blank in the title, such as "Schedule A Culv. Pipe ____ In. Diam.", the item is considered to be a standard item if it meets all applicable standards and is readily available from commercial sources.

TRUE

FALSE

3. Project specific special provisions require approval by Headquarters prior to inclusion in your contract.

TRUE

FALSE

4. Conflicting information in the contract documents will be resolved by the order of precedence set forth in the Standard Specifications. What is that Order of Precedence?

<input type="checkbox"/>	Contract Plans
<input type="checkbox"/>	Addendum
<input type="checkbox"/>	Proposal
<input type="checkbox"/>	Special Provisions
<input type="checkbox"/>	Amendments
<input type="checkbox"/>	Standard Plans
<input type="checkbox"/>	Standard Specifications

5. Which type of specification does WSDOT use the most? (Choose One)

Method

End Results

Introduction

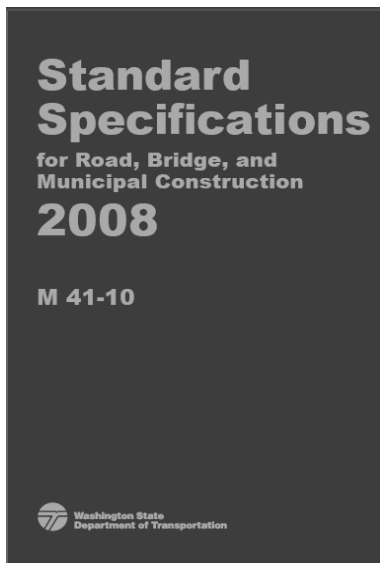
What are we trying to say?

The contract provisions are a publication addressing the work required for an individual project. At the time of the call for bids, the contract provisions may include, for a specific individual project, the following:

- Notice to Planholders (Project Engineer's name, address and phone number)
- Table of Contents
- Amendments (revisions to the Standard Specifications)
- Special Provisions (combination of the general special provisions [GSP's] and project specific provisions)
- Boring Logs (on bridge or structure project -- provided by bridge and structures office)
- Federal Aid Provisions (on federal aid projects)
- Prevailing Minimum Hourly Wage Rates (state, federal, or both, depending on project funding)
- Proposal (informational copy)
 - a. Subcontractor List
 - b. Signature Page
 - c. Declaration of Non-Collusion
 - d. Certification for Federal Aid Contractors
- Appendices to the Special Provisions.
- Forest Service Provisions (if applicable)
- Railroad Insurance forms (if applicable)
- Other Documents

Contract Documents

Standard Specifications



The Standard Specification contains provisions and requirements for prescribed work on WSDOT contracts.

They're called Standard Specifications because contractors and agencies have been using and are familiar with them.

The Standard Specifications are automatically included in every project

Amendments to the Standard Specifications

The amendments are revisions to the _____, distributed by the HQ Project Development Branch, that occur between printings of the Standard Specifications.

It is important that all designers get the opportunity to see the amendments when they are distributed, so they are aware of changes in requirements, materials, and how work is being measured and paid. Too often, the most recent amendments are included in a project, and they conflict with information in the special provisions, the plans, or both, because the designer did not stay current with the changes. These conflicts can, and do, cost money.

The Amendments to the Standard Specifications are:

- Maintained by HQ Construction Office
- Periodical updated (approx 4 times per year (revisions to current, or new, amendments)
- They are printed on pink paper for Advertising

Special Provisions

The special provisions consist of the general special provisions (GSPs) and the project specific provisions. Because the GSPs and the project specific provisions are to be combined and intermixed when compiling the special provisions, this section will discuss both.

General Special Provisions (GSPs)

The GSPs are provisions that have been written to cover legal and construction requirements that may occur on a project. They supplement or revise the Standard Specifications.

Regional General Special Provisions (RGSPs)

RGSPs have been created and adopted for _____ use. RGSPs are used when a statewide GSP does not apply in its entirety (e.g. a Region method differs from normal method used statewide).

Project Specific Special Provisions

The project specific provisions are written by the designer to supplement or revise information in the Standard Specifications and amendments to make them fit the project being developed. Project specific provisions are not to duplicate information contained in the Standard Specifications, amendments, GSPs, or plans.

Two things to consider whenever a project-specific special provision included in the project:

- e. Preparation shall be in accordance with PPM Section 640
- f. Justification for the Special Provision is to be sent to the HQ Construction Office and concurrence from them received prior to the start of the Pre-Ad review (~10 weeks before Ad Date).

Addendum

A change made to the contract documents after the project is advertised but before the bids are opened is called an “Addendum”. Plural form is “Addenda”.

A change to a contract provision should be made only if it affects the Contractors’ ability to provide a responsive bid.

PPM Section 750.01 – contains general information about Addenda. The methods to be used for revising, adding or deleting contract provisions by addendum are illustrated in PPM Appendix A5.

Order of Precedence

1-04.2 Coordination of Contract Documents, Plans, Special Provisions Specifications, and Addenda

The complete contract includes these parts: the contract form, bidder's completed proposal form, contract plans, contract provisions, standard specifications, standard plans, addenda, various certifications and affidavits, supplemental agreements, change orders, and subsurface boring logs (if any). These parts complement each other in describing a complete work. Any requirement in one part binds as if stated in all parts. The Contractor shall provide any work or materials clearly implied in the contract even if the contract does not mention it specifically.

Any inconsistency in the parts of the contract shall be resolved by following this order of precedence (e.g., 1 presiding over 2, 3, 4, 5, 6, and 7; 2 presiding over 3, 4, 5, 6, and 7; and so forth):

_____	Proposal Form
_____	Contract Plans
_____	Standard Plans
_____	Addenda
_____	Standard Specifications
_____	Special Provisions
_____	Amendments

On the contract plans, working drawings, and standard plans, figured dimensions shall take precedence over scaled dimensions. This order of precedence shall not apply when work is required by one part of the contract but omitted from another part or parts of the contract. The work required in one part must be furnished even if not mentioned in other parts of the contract.

If any part of the contract requires work that does not include a description for how the work is to be performed, the work shall be performed in accordance with standard trade practice(s). For purposes of the contract, a standard trade practice is one having such regularity of observance in the trade as to justify an expectation that it will be observed by the Contractor in doing the work.

In case of any ambiguity or dispute over interpreting the contract, the Engineer's decision will be final as provided in Section 1-05.1.

2008 Standard Specifications

Who uses Contract Provisions?

Contractor and Construction PE Staff

Roles and Responsibilities

Specification Writers

- ✓ Ensure every provision applies to the project
- ✓ Prepare Contract Provisions using the special version of Microsoft Word
- ✓ Prepare justification and secure approvals for each project-specific special provision included in contract
- ✓ Coordinate and incorporate contract provisions prepared by Others
- ✓ Perform quality checks
- ✓ Communicate changes
- ✓ Provide documentation

Project Managers

- ✓ Ensure contract provisions have been prepared in accordance with:
 - Approved Design Documentation Package
 - Plans Preparation Manual
 - Required permits, approvals, clearances, and certifications
- ✓ Provide justification and obtain approval for:
 - Proprietary items
 - Non-standard liquidated damages
 - Incentive/disincentive pay
 - Non-standard Time for Completion specifications
- ✓ Ensure review of contract provisions by appropriate region and HQ staff
- ✓ Ensure incorporation of all appropriate changes due to reviews prior to Advertisement

Resources and Tools

People

- Other Team Members
- Veteran Employees
- Other Design Offices
- Construction Office (inspectors)
- Region Plan Reviewers
- Subject Matter Experts
- Contractors / Suppliers
- Attorney General's Office

Other Resources

- Previous contracts
- Standard Specifications
- GSP Index
- Region GSPs
- Plans Preparation Manual
- Specification writing class
- Previous experience & training
- Plans Prep class literature

Types of Specifications

What is a Specification?

Write your definition of what you think a specification is.

A specification should answer the following questions:

What

How

How

What

How

Types of Specifications

There are three types of specifications that the WSDOT generally uses:

Method Specifications

Most Transportation Agencies historically have used what are referred to as Method Specifications (Also called Materials & Methods Specifications, Recipe Specifications, or Prescriptive Specifications).

A Method Specification spells out exactly the equipment, methods, materials, and techniques a Contractor will be required to use. The Contractor or Producer is directed to combine specified materials in definite proportions and use specific types of equipment and methods in order to place the materials or product in a prescribed way.

Each step is controlled and in many cases directed by a Transportation Agency representative. In effect, the Agency rents the Contractor's personnel and equipment. This type of specification does not allow the Contractor to be innovative.

Descriptive

Advantages:

- Based on prior experience
- Known materials and methods

Disadvantages

- Designer lacks experience
- Unknown/new materials and methods

Reference

Advantages:

- Statewide, national, & industry standards
- Standardized materials and methods
- Lower overall volume of specifications

Disadvantages

- Usually minimum standards
- Citations are not specific enough
- Out of date editions or wrong references used

Proprietary

Advantages:

- Compatibility
- Reduced inventory
- No substitutions

Disadvantages

- No competition
- Premium cost
- Unknown or better options are precluded
- Requires justification and approval



Washington State
Department of Transportation

Memorandum

DATE: November 17, 2005

TO: Jim Eastman
SWR Assistant State Design Engineer
MS-47330

Approval: FHWA

By: *Steve Saxton*

Date: *01/09/06*

THRU: Rick Keniston/ Dave Bellinger *DB*

FROM: Chad Hancock/Tu Ho

CHH for CH

Concurrence: Assistant
State Design Engineer

SUBJECT: Blanket Proprietary Intelligent Transportation System (ITS) Item Approval Request

By: _____

Date: _____

Description

The SW Region is requesting blanket proprietary approval for the following ITS materials for the 2005-2007 biennium. The materials submitted are essential for synchronization with existing highway facilities. At this time, the SW Region is deploying, in partnership with the Oregon Department of Transportation (ODOT) and other local transportation agencies a Advanced Traffic Management System (ATMS) software for a joint freeway management system in the Portland/Vancouver area. The central ATMS software requires specific brand and product to be implemented in the system to ensure system compatibility. Given the varied array of other ITS partners WSDOT has throughout the state, consistency hardware and software is not possible at this time. In the future, as technology develops perhaps interfaces that are more open will be developed which will eliminate the need for proprietary items.

Each material is identified below, along with justification for each item.

Optelecom Video and Data Transmitter/Receiver

This brand of equipment currently carries video and/or data between the SW Region Traffic Management Center (TMC) and existing ITS field devices. The continued use of Optelecom equipment will ensure the compatibility and synchronization between existing and future ITS devices. Other brands are not compatible with existing systems.

Cohu Camera System

The I-dome series (current model # 3920) consists of a camera, pan/tilt unit, and control receiver. The existing TMC software can control Cohu control receivers. This product is required for synchronization with our existing system.

Specifying Materials

Open (Competitive)	No brand names	No approval
Closed (Proprietary)	1 brand names	Approval req'd
Restricted (Brand Names)	3 or more brands, “or approved equal” (+ Criteria)	No approval

Open or Competitive specifying

Encourages competition to get the best possible prices.

Closed or Proprietary

Must prepare proprietary justification for approval.

Restricted or Brand Name

Must prepare descriptive specification that includes criteria to judge whether alternate materials would be considered “equal”. Must contain phrase “or approved equal”.

End-Result Specifications

Under End-Result Specifications, the Contractor or Producer takes the entire responsibility for supplying a product or an item of construction. This type of specification does have the advantage of affording the Contractor the greatest amount of flexibility in exercising options for developing new techniques and procedures to perform the work and improve the quality of the end product.

True End-Result Specifications place no restrictions on the materials to be used or the methods of incorporating them into the completed product. This is a well-meaning consideration, but is definitely outweighed by the inherent disadvantages.

Performance

Advantages:

- Focus on performance and results
- Interdisciplinary approach
- Contractor innovation and cost efficiencies

Disadvantages

- Little WSDOT experience and expertise
- Test procedures and standards
- Did we omit something important?

Quality Assurance Specifications

Under a Quality Assurance Specification, the Contractor is responsible for Quality Control (QC) and the Transportation Agency is responsible for Acceptance of the product. Placing responsibility for Quality Control sampling, testing, and inspection in the hands of the Producer and Contractor is consistent with what is normally required in virtually all other business sectors that manufacture or produce products (e.g. electronics, appliances, automobiles, airplanes, food items).

As part of their Acceptance responsibilities, Agency technicians and inspectors must monitor the Contractor's QC activities and still have a responsibility for Acceptance sampling, testing, and inspection.

Quality Assurance

Advantages:

- Increased payment for superior work
- Reduce payment for lesser quality work

Disadvantages

- May get a less quality work

Quick Quiz

COLUMN A		COLUMN B
_____	Descriptive A	These are outright declarations to use a specific manufacturer's product by listing its make, model, catalog number in the specification.
_____	Reference B	In this type of specification, the end result is paramount to the Contracting Agency; the means of achieving the result becomes the Contractor's responsibility .
_____	Proprietary C	Spells everything out for the Contractor: <ul style="list-style-type: none">▪ Materials to be used▪ Techniques required to fabricate, erect, and install the materials
_____	Quality Assurance D	These specifications refer to standards established for: <ul style="list-style-type: none">▪ Materials▪ Test Methods▪ Installation Procedures
_____	Performance E	Specifications that require Contractor Quality Control and Agency Acceptance activities throughout production and placement of a product.

Standard Items & Specifications

What's a Standard Item?

A standard is something, such as a practice or a product that is widely recognized or employed, especially because of its excellence. Standard Bid Items fit into this definition and are listed in the Standard Item Table. Not all of the Standard Items are listed there only the ones that the WSDOT has chosen to track.

Why should we use our standard bid items?

Standard Item Table

http://www.wsdot.wa.gov/eesc/design/projectdev/AdReady/SIT/englishSIT.pdf - Microsoft Internet Explorer provided by WSDOT Versi

File Edit View Favorites Tools Help

Back Forward Stop Search Favorites History Print

Address http://www.wsdot.wa.gov/eesc/design/projectdev/AdReady/SIT/englishSIT.pdf Go Links

Page 1 of 82

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

Date: 04/25/2003
DOT-RGG101

STANDARD ITEM TABLE - ENGLISH

STD ITEM NUMBER	UNIT OF MEASURE	DESCRIPTION	PREQUAL CODE	ITEM USE
0001	L.S.	MOBILIZATION	A1	STANDARD ITEM
0002	L.S.	MOBILIZATION----- (43)	A1	REQUIRES SPECIAL PROV.
0025	ACRE	CLEARING AND GRUBBING	D6	STANDARD ITEM
0030	ACRE	CLEARING AND GRUBBING - SITE----- (27)	D6	STANDARD ITEM
0035	L.S.	CLEARING AND GRUBBING	D6	STD. ITEM, GSP REQUIRED
0040	L.S.	CLEARING AND GRUBBING - SITE----- (27)	D6	STD. ITEM, GSP REQUIRED
0044	C.Y.	STRIPPING INCL. HAUL	D6	STANDARD ITEM
0045	C.Y.	STRIPPING INCL. HAUL - SITE----- (28)	D6	STANDARD ITEM
0038	EST.	ARCHAEOLOGICAL AND HIST	A1	GSP ITEM
0047	EACH	REMOVING MANHOLE	G2	REQUIRES SPECIAL PROV.
0049	EACH	REMOVING DRAINAGE STRUC	G2	REQUIRES SPECIAL PROV.
0050	L.S.	REMOVAL OF STRUCTURE AND OBSTRUCTION	F8	STANDARD ITEM
0060	L.S.	REMOVING PORTION OF EXISTING STRUCTURE----- (17)	F8	GSP ITEM
0061	L.S.	REMOVING PORTION OF EXISTING STRUCTURE----- (17)	F8	REQUIRES SPECIAL PROV.
0062	L.S.	REMOVING PORTION OF EXISTING STRUCTURE----- (17)	F8	REQUIRES SPECIAL PROV.

Some items require Add-on Descriptions. (xx) = # characters

Std Items have pre-assigned Prequal Codes

Follow item order not item #

Provide GSP or Special Provision as directed by Use Message

Standard Specifications

The Standard Specifications for Road, Bridge and Municipal Construction have been developed to serve as a baseline for the work that is delivered to the public by the WSDOT. The Standard Specifications are incorporated into the contract between WSDOT as Contracting Agency and the Contractor except where the Contract indicates that a particular specification has been amended or replaced with a special provision to resolve a project specific issue. The decision to amend or replace any standard specification with a special provision is made during the design process and is based upon sound engineering judgment of the project designer.

The Standard Specifications reflect years of refinement through the hundreds of projects that the WSDOT delivers each year. The Standard Specifications are the results of hours of development and review by WSDOT and the Associated General Contractors (AGC).

These standards also reflect the contracting philosophy and balance of risk-sharing that the WSDOT has adopted through the years. The WSDOT believes that this balance of risks gives us the lowest final cost solution to our transportation needs.

The Standard Specifications are divided into 9 separate divisions.

- Division 1 covers Construction Administration
- Division 2-8 covers work typically included in our contracts
 - 2) Earthwork
 - 3) Production from Quarry and Pit Sites and Stockpiling
 - 4) Bases
 - 5) Surface Treatments and Pavements
 - 6) Structures
 - 7) Drainage Structures, Storm Sewers, Sanitary Sewers, Water Mains and Conduits
 - 8) Miscellaneous Construction
- Division 9 cover materials used in Division 2-8

Standard Item Exercise

Instructions

Look up the Standard Specification reference for the bid items below.

Item No	Std Item No.	Unit	Item	2006 Standard Specifications
			Preparation	
1	0001	LS	Mobilization	Standard Spec
2	0170	LF	Removing Guardrail	Standard Spec
			Grading	
	0332	SY	Pavement Repair Excavation Incl. Haul	Standard Spec
			Surfacing	
4	5100	Ton	Crushed Surfacing Base Course	Standard Spec
			Liquid Asphalt	
5	5334	Dol	Anti-Stripping Additive	Standard Spec
			Asphalt Concrete Pavement	
6	5703	Dol	Crack Sealing	Standard Spec
7	5711	SY	Planing Bituminous Pavement	Standard Spec
8	5767	Ton	HMA CL. ½ IN. PG 64-28	Standard Spec
11	5830	Dol	Job Mix Compliance Price Adjustment	Standard Spec
12	5835	Dol	Compaction Price Adjustment	Standard Spec
			Erosion Control and Planting	
14	6489	Dol	Temporary Water Pollution/Erosion Control	Standard Spec

			Traffic	
15	6716	Each	Beam Guardrail Flared Terminal	Standard Spec
16	6807	LF	Plastic Line	Standard Spec
17	6857	SF	Plastic Crosswalk Line	Standard Spec
18	6859	LF	Plastic Stop Line	Standard Spec
19	6833	Each	Plastic Traffic Arrow	Standard Spec
20	6994	Each	Portable Changeable Message Sign	Standard Spec
21	6995	Hour	Operation of Portable Changeable Message Sign	Standard Spec
22	6964	LS	Temporary Traffic Control Devices	Standard Spec
23	6980	Hour	Flaggers and Spotters	Standard Spec
24	6992	Hour	Other Traffic Control Labor	Standard Spec
25	6974	LS	Traffic Control Supervisor	Standard Spec
26	6982	SF	Construction Signs Class A	Standard Spec
			Other Items	
27	7480	Dol	Roadside Cleanup	Standard Spec
28	7725	Dol	Reimbursement for Third Party Damage	Standard Spec
29	7728	Dol	Minor Change	Standard Spec
30	7736	LS	SPCC Plan	Standard Spec

Each section in Divisions 2-8 is formatted as follows:

Format of Sections in Divisions 2 – 8:	
Description	Work to be performed (eg. 8-11.1)
Materials	Requirements, cross reference to Division 9 (eg. 8-11.2)
Construction Requirements	Construction methods; sequence Testing requirements (eg. 8-11.3)
Measurement	What, how and when (eg. 8-11.4)
Payment	Pay items and method of payment (eg. 8-11.5)

DESCRIPTION

- Brief and general descriptions
- Always begin with “This work shall consist of...”
- Uses phrases like “furnishing and installing” and “removing and disposing of”
- Do not use phrases in description such as:
 - As detailed in the plans
 - At the locations shown in the plans
 - As directed by the Engineer

MATERIALS

- List the materials needed for the work
- Reference publications when applicable:
 - Division 9 of the Standard Specification
 - ASSHTO
 - ASTM
 - ANSI

CONSTRUCTION REQUIREMENTS

- Don't mix Method Specs with End Performance Specs
- Specify the criteria for acceptance
 - Test requirements
- Write in order that the work is to be performed
- Requirements must be measurable.
- Don't use "As directed by the Engineer".
- Say it once. If it's in the plans, it's not needed in the specs.
- Don't explain or justify requirements or procedures.

MEASUREMENT

- What is being measured not the item name
- The unit of measurement
- How it's being measured

PAYMENT

- Payment will be made in accordance with Section 1-04.1, for the following items:
- "Exact Item Name", per unit of measured

Incidental to (work)	Included in (payment)
<p>"All costs associated with [incidental item] shall be included in the unit contract price for [major item]."</p> <p>"All costs associated with furnishing and installing gravel backfill for bedding manholes and catch basins shall be included in the unit contract price for the item [manhole or catch basin] installed."</p>	

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Module 13

Amendments, GSPs & RGSPs

When should you start?

- Early!
- Inventory needs as:
 - ✓ Decisions are made
 - ✓ You determine a provision will be required
- Obtain approvals ASAP; add to design documentation file

Contract Provision Preparation Flow Chart

See Plans Preparation Manual Division 6

Creating Contract Provisions Using Microsoft Word

The Microsoft Word macros provide access to current Amendments, GSPs, and Region GSPs from your PC.

PS&E Project Selection

Washington State
Department of Transportation

**Strategic Analysis
&
Estimating Office**

Headquarters
Engineering & Environmental

Version 4.0: October 2008

PS&E Contract Provision Preparation

Project Name:

Title:

Office: ☐ Plan Review ☒ Design

Units: ☒ English ☐ Metric

Zoom: 100

Open Project New Project Delete Project Close

See the Plans Preparation Manual Appendix A-2. For training using these macros contact your Region Plans or PS&E Review team or Theresa Schreier (360) 705-7467

Amendments and GSPs

Each amendment and GSP is given a unique code number (file name), which ties it back to the section of the Standard Specifications being supplemented or revised by the document.

.AP*	English A amendment
.GR*	G eneral R oadway GSP; no fill-in
.FR*	F ill-in R oadway GSP
.GB*	G eneral B ridge GSP; no fill-in
.FB*	F ill-in B ridge GSP
.DT^	Region (D istrict) GSP

Depending on the type of provision will determine the extension name of the file. Each provision has a two alpha character extension followed by a numeric number which references the division of the Standard Specifications with the exception of the Regional GSP in which it references the district number.

Amendments Code Example

.AP*	English A amendment
-------------	----------------------------

02.AP1	Section 2 of Division 1 Or 1-02 of the Standard Spec
---------------	---

When changes are made to the Standard Specification the supplements or revisions are made to that section in the division.

1	01.AP1	
2	SECTION 1-01, DEFINITIONS AND TERMS	
3	June 26, 2000	
4	1-01.2(1) Associations and Miscellaneous	1-01.2(1): Abbreviations added
5	This section is supplemented with the following:	
6		
7	FOP Field Operating Procedure	
8	WAQTC Western Alliance for Quality Transportation Construction	
9	SOP Standard Operating Procedure	
10		
11	02.AP1	
12	SECTION 1-02, BID PROCEDURES AND CONDITIONS	
13	February 5, 2001	
14	1-02.8(1) Noncollusion Declaration	
15	In the first sentence of the second paragraph the reference to "23 CFR Part 635.107(i)(1)" is	
16	revised to read "23 CFR 635.112(f)".	
17		
18	In the third sentence of the second paragraph the reference to "23 CFR Part 635.107(i)" is	
19	revised to read "23 CFR 635.112(f)(1)".	1-02.8(1): References revised
20		

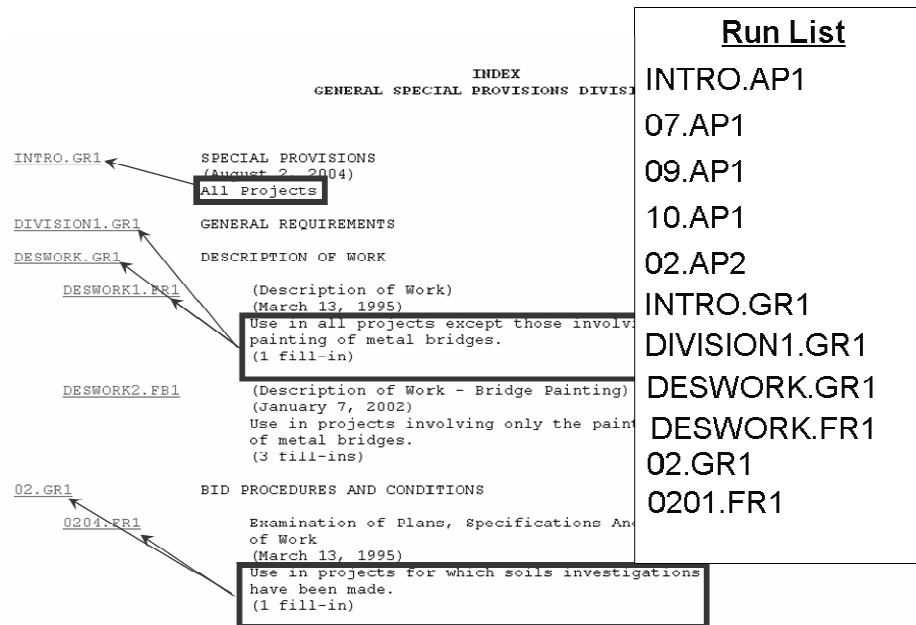
If you were to open file 01.AP1 and 02.AP1 you would read the text as shown above. In the first amendment, the subsection “Associations and Miscellaneous” is being supplemented with new acronyms. In the second amendment, the subsection “Bid Procedures and Conditions” has a reference specification that is being revised.

General Special Provision Code Example

.GR*	General Roadway GSP; no fill-in
05.GR7	Section 05 of Division 7 or 7-05
0503.GR7	Section 05, Sub 03 of Division 7 Or 7-05.3
050301.GR7	Section 05, Subsection 03, Sub/Subsection 01 of Division 7 Or 7-05.3(1)

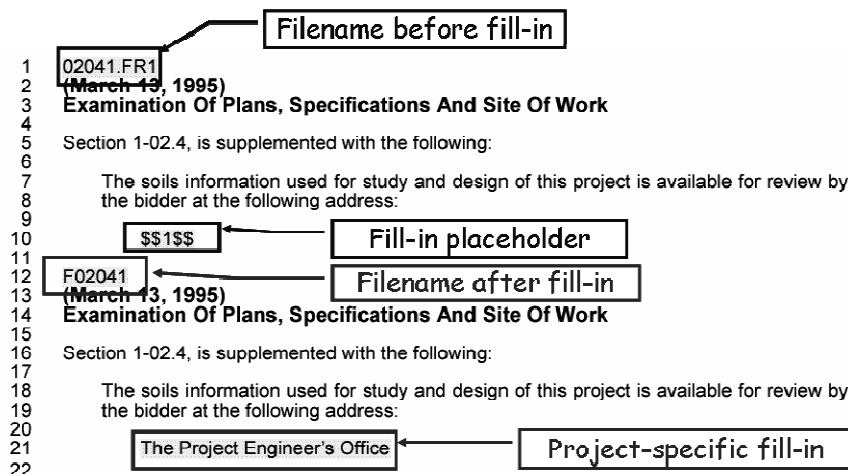
Unlike the Amendments, GSPs revises or supplements subsection, sub-subsection, and so forth. The GSP 020315B.GR8 revises or supplements what work?

Run Lists



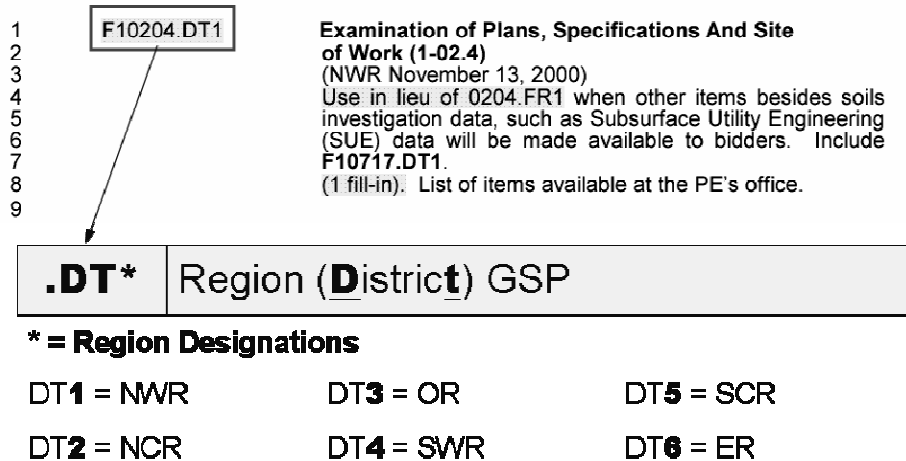
When selecting subsections files for your Run List, the division and section files need to be included.

Example Fill-in GSP

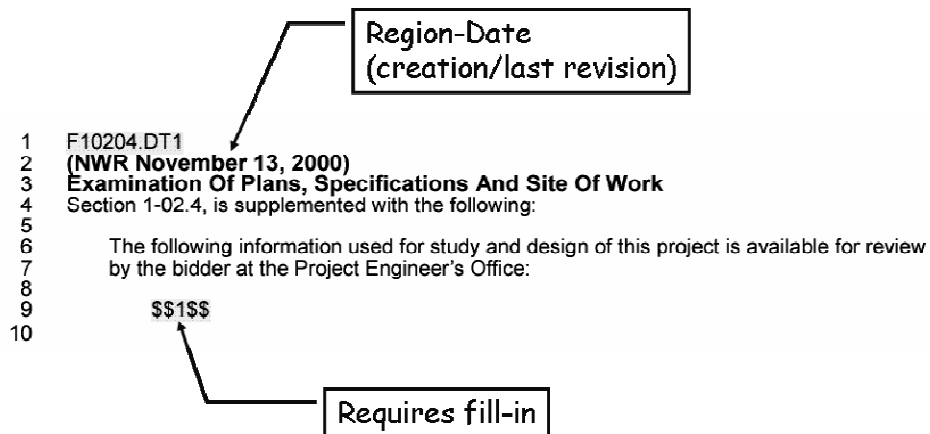


Fill-in GSP file names need to be renamed after filling in the placeholder

Example Region GSP



Regional GSPs are different from Statewide GSPs as the Division number is included in the filename and not in the extension.



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Specification Development

Time to sharpen the pencil

Project specific provisions should be thought of as “project specific amendments”. In order to know what information needs to be added, to supplement the information in the Standard Specifications, or what information in the Standard Specifications needs to be revised to be applicable to the project, the designer has to be familiar with the information in the Standard Specifications.

No one is expected to memorize the Standard Specifications, but the designer is expected to read applicable information in the Standard Specifications and amendments before they sit down and start writing. The field inspector will be using the Standard Specifications to construct the project, so it is reasonable that the designer use the Standard Specifications as a design tool and the basis for every project specific provision they write.

Spec Preparer...

Applies the 4 C's of good writing:

Clear	No ambiguity
Concise	No excess verbiage
Complete	All required information & in proper format
Correct	Information technically accurate & applies to project

The 5th C is _____ Strive to achieve between project

When are specifications hard to write?

- When we're writing new specifications
- When we're using innovated items
- When we're using items we haven't used before

Analytical mind; sees

- Steps
- Interrelationships
- Consequences
- Grasps new ideas & concepts quickly
- Sees the entire project
- Focuses on details
- Has the technical know-how
- Knows the audience
- Recognize changes in users' needs
- Works well under pressure
- Accepts constructive criticism
- Possesses good English writing skills

Writing Style

- Uses the simplest word that accurately conveys the thought
- Keeps sentences short (17 to 20 words)
- Avoids
- Run-on sentences
- Going off on tangents
- Keeps paragraphs short (3 to 4 sentences)
- Writes conversationally (as it would be said)
- Writes in positive form; prepares instructions that tell what to do instead of what not to do

Contra Proferentem

If there are two reasonable interpretations, the courts generally follow the rule that language is interpreted against the interest of the party who wrote it.

Remember the term:

Reasonable Interpretation

A good special provision will only have one.

Specification Language

What do these words mean?

Shall _____

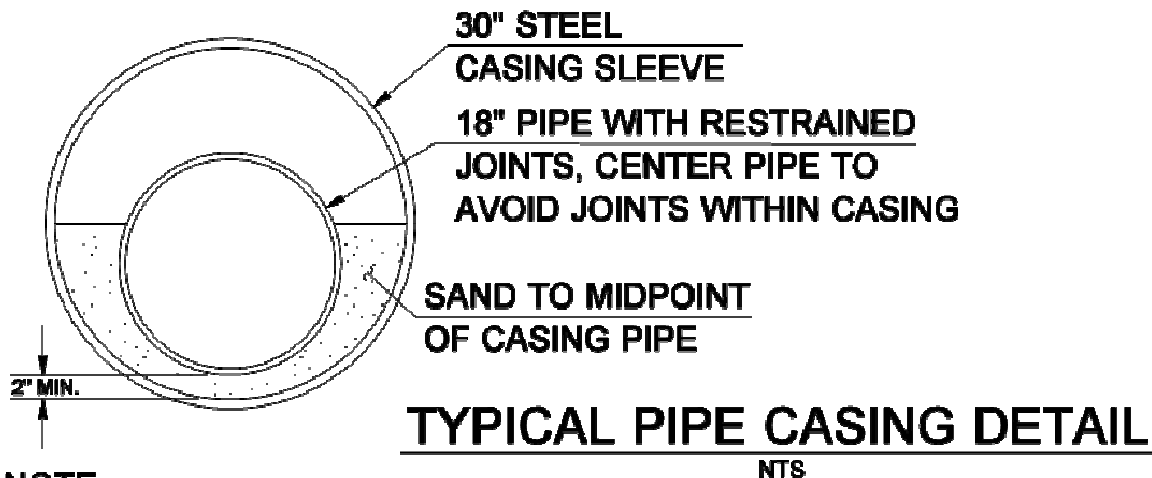
Will _____

Avoid using “should and must”. They are just suggestions.

Use this	Instead of
“all”	“any” (implies a choice)
“each”	“either” (implies a choice)
“...due to the Contractor’s <u>operation</u> .”	“...due to the Contractor’s <u>negligence</u> .”
“or” or “both”	“and/or”
Provide a complete list	“etc.” (at the end of a list)
Specify what is required to be acceptable	“...to the satisfaction of the Engineer.”

Any	Limited number selected by reader
All	Entire quantity or amount
Amount	Use when referring to money
Quantity	Use when referring to volume, yardage, etc.

Details or Provisions?



NOTE:

1. CASING SLEEVE SHALL EXTEND A MINIMUM OF 10' PAST THE EDGE OF THE SHOULDER ON BOTH SIDES OF THE EXISTING ROADWAY.

PIPE CASING

Ductile iron pipe shall be installed in accordance with the details and to the line, grade, and slope shown in the Plans. The annular space between the casing and the pipe shall be filled with sand to prevent pipe flotation. Sand filling shall be accomplished by blowing the sand from the two ends using a gunite machine or other approved equipment. Sand blowing, once begun, shall be completed without stopping.

PROCEDURES FOR REVIEW OF PROPOSED PROJECT SPECIFIC SPECIAL PROVISIONS

Existing Standard Specifications and General Special Provisions (including BSP's) are preapproved for use. Any departure from these, be it revision, deletion, replacement or supplement, requires approval of the Construction Office as follows

Division 1	State Const Engr, Admin (Craig McDaniel or David Jones)
Division 6	State Const Engr, Bridge (Mohammed Sheikhezadeh)
Division 2-5 & 7-8	State Const Engr, Roadway (Jim Spaid)
Division 9	Sheikhezadeh or Spaid depending on Bridge or Rdwy—They will review any change in this section with the HQ Materials Lab before granting approval.

Prior Discussions:

Don't waste a lot of time and effort writing a special provision and submitting it for review without prior discussions. Talk it over before you start. Invite both the Construction PE and HQ Construction into the project strategy discussions before any PS&E work is started. Discuss concepts and potential conflicts with specifications at an early stage and there is a far greater chance for the development of a successful specification. Under no circumstances should a special provision be developed without consultation from the Construction PE or, where no PE has been identified, from the Region Construction Office.

Timeliness:

The worst time for a submittal, and the most likely cause for a submittal to be rejected out of hand, is one day before the Ad date. Special Provisions should be developed well ahead of the final review set.

Why is a special provision necessary?

HQ Construction will assume that a standard specification is fine unless you provide a sound reason why it is not. There seem to be four types of reasons for change proposals:

1. The situation is such that no standard specification covers the work required (mechanical/electrical rehabilitations, 'new' technology, ITS systems, seismic retrofits, buildings, new products.)
2. The standard spec is fine, but it just doesn't work in the situation we're faced with. (If you make a good case and if you've written a good spec, we'll approve these for you.)
3. The standard spec is flawed and doesn't do the job. (In this case, and if you've written a good spec, we'll approve your proposal and start immediately to work on fixing the standard spec.)
4. There's nothing wrong with the standard spec, we just don't want to do it that way. (Most likely will be rejected.)

In any case, your proposal must be accompanied by an explanation. Don't plan on others figuring out why you want to do this or even what your spec is trying to say. If your submittal does not provide adequate justification it will be rejected before a review of the special provision is made.

Who says a special provision is needed and appropriate?

As a first review, the Design PE does. Do NOT take support group special provision packages and simply staple them onto a project package. The special provisions prepared by a support group must be reviewed to ensure that they fit within the specifications/special provisions of your project. All special provisions included in a project are considered to belong to the design PE.

As a designer, you are working in a design office under the direct supervision of a professional engineer. The Design PE must endorse the specification/special provision proposal before it goes out for review.

The PS&E you are preparing will be administered by a construction project engineer. All proposals should receive concurrence from the construction PE or the Region Construction Office before it goes to Region or Headquarter review.

Each Region will set its own region review/approval policies.

HQ Construction will not approve any proposal that does not have the concurrence of the Region's construction people, either the PE or the supervisor of PE's. The request to HQ Construction should be made directly from the Design PE or, at the very least, at the specific direction of that engineering supervisor.

If a Proposed Spec has passed those hurdles, then what?

HQ Construction will look at the spec from several points of view. Is it clear and concise? Does it conflict in any way with other specifications or project provisions? Is it legal? Does it satisfy all Federal spec requirements? Does it maintain the Department's philosophy of sharing risk with the Contractor? Is it enforceable? Can the Contractor bid it competently? Are grammar, punctuation and spelling perfect? Is there any chance for ambiguity? (Can it be interpreted in more than one way?) Does the spec still work if things don't go as expected? Do other specs have to be modified to make it work?

HQ Construction will accept proposals in any format and attempt to answer them. The preferred, and the most effective, method of communication is e-mail with attached documents. You can address e-mails to the right person listed above, or to anyone else in the Construction Office, who will forward your message to the right desk.

Then what happens?

Reviews are tracked via outlook folders. Once your special provisions receive HQ approval the approved format will be posted in an outlook folder. HQ Plans Review will refer to these approved special provisions when reviewing a PS&E.

You can find storage folders in the Exchange server for Outlook. They are listed under "All Public Folders\WSDOT\Construction" in four sub-folders. The first is catalogued by project name and contains communications and discussions that have not yet led to approvals. The second is also catalogued by project name and contains approvals granted for the job. The third is sorted by Contract Number and contains folders for jobs that are on Ad. The fourth and final subfolder is an archive of approvals for jobs that have been awarded and are underway.

Tips from the Construction Office:

- ✓ Strive for end-product rather than method specs
- ✓ If you get an end-product that works, don't try to impose methods, too
- ✓ Don't try to manage the Contractor's schedule
- ✓ Don't use calendar days
- ✓ Don't use a calendar end date
- ✓ Don't use 7-day weeks except rarely
- ✓ Don't try to make the Contractor responsible for weather
- ✓ Don't even think about innovative specs without thorough prior consultation
- ✓ Don't try to insert a warranty
- ✓ If you're using an incentive or damage amount, include a justification
- ✓ Don't try to leave flexibility for the Project Engineer
- ✓ Don't use the expression "as directed by the Engineer"
- ✓ Don't include post-award qualification of subs
- ✓ Don't use "incidental" unless it really can't be measured and bid. Make sure that the incidental work is tied to a logical bid item and not "other items of work"
- ✓ If you use "costs are covered by other items," state which costs and which other items.
- ✓ Write specs—Don't use "we'll know it when we see it"
- ✓ No "just in case" special provisions (or quantities)
- ✓ Many specifications have been negotiated with industry groups such as AGC, WAPA, etc. Suggested changes to these specs will likely be denied
- ✓ Don't relinquish design responsibilities to the contractor
- ✓ Don't use material specs that aren't needed – for example using gravel borrow when select borrow or common borrow would be adequate
- ✓ Use a format similar to the Standard Specifications (description, materials, construction requirements, measurement, payment)

Project Specific Special Provisions

The project specific provisions are written by the designer to supplement or revise information in the Standard Specifications and amendments to make them fit the project being developed.

Project specific provisions are not to duplicate information contained in the Standard Specifications, amendments, GSPs, or plans.

Approval of project specific specifications that alter Standard Specifications for Road, Bridge, and Municipal Construction (WSDOT Spec book) is required prior to inclusion in your contract. All project specific specifications are to be sent, along with justification, to the State Construction Engineer for concurrence and approval.

Flow Charts

Supplement or Modify	Standard Specs	PPM 630 & Flow Chart 1
	GSPs	
	RGSPs	
Stand Alone	Descriptive	PPM 640 & Flow Chart 2
	Performance	

What these words mean

Supplemented with - Adds something to an existing specification

Revised to read - Replaces all or part of an existing specification (be specific)

Deleted - All or part of a specification no longer applies to contract (be specific)

Supplementing – Example 1

ROADWAY EXCAVATION AND EMBANKMENT

Construction Requirements

Roadway Ditches

Section 2-03.3(9) is supplemented with the following:

(insert)

Project specific information goes here

Information supplements existing
Std Specs subsection, Roadway
Ditches

This examples shows project specific information supplementing an existing subsection of the standard specs. **PPM 630.03**

Supplementing – Example 2

ROADWAY EXCAVATION AND EMBANKMENT

Construction Requirements

Section 2-03.3 is supplemented with the following:

(insert)

Rock Fallout Ditches

Project specific information goes here

New subheading under Construction
Requirements section of Std Specs

This example introduces a new subheading and project specific information to an existing section of the standard specifications. **PPM 630.03**

Revising – Example

ROADWAY EXCAVATION AND EMBANKMENT

Construction Requirements

Roadway Ditches

The first paragraph of Section 2-03.3(9) is revised to read:

(insert)

Project specific information goes here

For revisions, be very specific about
what is being changed or replaced

Here is an example of revising an existing section of the standard specifications. Notice how specific the introductory sentence is. Many amendments are formulated this way.

Supplementing/Revising a Provision Exercise

Provision Problem 1

While reviewing your project with Maintenance, during the Preliminary Engineering phase, they state that they have been having problems with their snowplows catching the edges of the catch basins. When the plows strike the basins, it results in severely damaging them. In order to alleviate this problem, they have requested the basins be adjusted a couple of hundredths lower throughout the project.

Provision Problem 2

During the same meeting with Maintenance, they also state they have been having problems with their snowplows hitting the top of the monuments case and covers. To alleviate this problem, they requested that the monuments case and covers also be lowered during construction.

Ensure that both of these items of work are addressed in your contract provisions.

Hints:

- ✓ Are these items already covered by an existing provision? (Standard Spec, Amendments, GSP, or Region Spec)
- ✓ Can you supplement or revise an existing specification?
- ✓ For supplementing an existing provision, follow the directions in Flow Chart 1, Division 6 in your Plans Preparation Manual.

GENERAL SPECIAL PROVISIONS

DIVISION 7

MANHOLES, INLETS, CATCH BASINS, AND DRYWELLS

Materials

Grate Inlets And Drop Inlets

Section 9-05.16 is supplemented with the following:
(December 4, 2006)

The Contractor shall furnish and install Grate B, as shown in the Standard Plans, on all grate inlets.

DIVISION 8

MONUMENT CASES

Description

(March 13, 1995)

Section 8-13.1 is deleted and replaced by the following:

This work shall consist of furnishing and placing monument cases, covers, and pipes in accordance with the Standard Plans and these Specifications, in conformity with the lines and locations shown in the Plans or as staked by the Engineer.

Materials

(March 13, 1995)

Section 8-13.2 is supplemented with the following:

The pipe shall be Schedule 40 galvanized pipe.

Construction Requirements

(March 13, 1995)

The last paragraph of Section 8-13.3 is revised to read:

The Engineer will be responsible for placing the concrete core and tack or wire inside the pipe.

Measurement

(March 13, 1995)

Section 8-13.4 is deleted and replaced by the following:

Measurement of monument case, cover, and pipe will be by the unit for each monument case, cover, and pipe furnished and set.

Payment

(April 28, 1997)

Section 8-13.5 is supplemented with the following:

"Monument Case, Cover, and Pipe", per each.

REGIONAL GENERAL SPECIAL PROVISIONS

DIVISION 8

MONUMENT CASES

Construction Requirements

(NE June 12, 2006)

Adjust Monument Case And Cover

Section 8-13.3 is supplemented with the following:

Adjustment shall be accomplished by raising the existing monument case and cover. All adjustments shall be done by the Contractor after the final course of paving has been constructed.

Measurement

(NE June 12, 2006)

Section 8-13.4 is supplemented with the following:

Measurement for adjust monument case and cover will be by the unit for each monument case and cover adjusted.

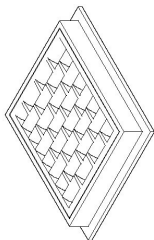
Payment

(NE June 12, 2006)

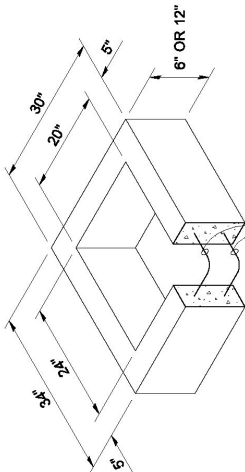
Section 8-13.5 is supplemented with the following:

The unit contract price per each for "Adjust Monument Case and Cover" shall be full pay for performing the work as specified.

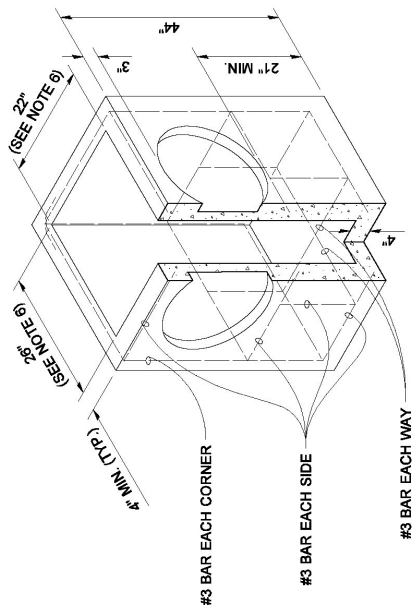
DRAWN BY: MARK SUJKA



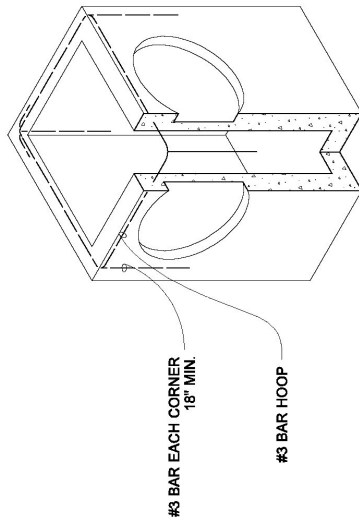
FRAME AND VANED GRATE



RECTANGULAR ADJUSTMENT SECTION



PRECAST BASE SECTION

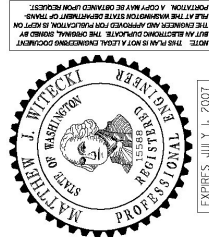


ALTERNATIVE PRECAST BASE SECTION

NOTES

- As acceptable alternatives to the rebar shown in the **PRECAST BASE SECTION**, fibers (placed according to the Standard Specifications), or wire mesh having a minimum area of 0.12 square inches per foot shall be used with the minimum required rebar shown in the **ALTERNATIVE PRECAST BASE SECTION**. Wire mesh shall not be placed in the knockouts.
- The knockout diameter shall not be greater than 20". Knockouts shall have a wall thickness of 2" minimum to 2.5" maximum. Provide a 1.5" minimum gap between the knockout wall and the outside of the pipe. After the pipe is installed, fill the gap with joint mortar in accordance with Standard Specification 9-04.3.
- The maximum depth from the finished grade to the lowest pipe invert shall be 5'.
- The frame and grate may be installed with the flange up or down. The frame may be cast into the adjustment section.
- The Precast Base Section may have a rounded floor, and the walls may be sloped at a rate of 1:24 or steeper.
- The opening shall be measured at the top of the precast base section.
- All pickup holes shall be grouted full after the basin has been placed.

PIPE ALLOWANCES	
PIPE MATERIAL	MAXIMUM INSIDE DIAMETER
REINFORCED OR PLAIN CONCRETE	12"
ALL METAL PIPE	15"
CPSPSP *	12"
(STD. SPEC. 9-05.20)	
SOLID WALL PVC	15"
(STD. SPEC. 9-05.12(1))	
PROFILE WALL PVC	
(STD. SPEC. 9-05.12(2))	
* CORRUGATED POLYETHYLENE STORM SEWER PIPE	



EXPIRES JULY 1, 2007

CATCH BASIN TYPE 1

STANDARD PLAN B-5.20-00

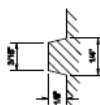
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Harold J. Peterfeso
STATE DESIGN ENGINEER
Washington State Department of Transportation
DATE 06-01-06

- NOTES**
1. Dimensions may vary according to manufacturer.
 2. Base to be placed on a well compacted foundation.
 3. Monument case to be finished by contractor.
 4. See Standard Plan A-10-30 for Monument Base and type to place in 12" O.D. galvanized pipe.

APPROXIMATE WEIGHTS	
CASE	90 LBS
COVER	10 LBS
TOTAL	100 LBS



SECTION OF LETTER

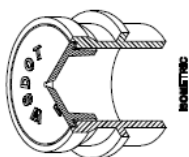


MONUMENT CASE AND COVER

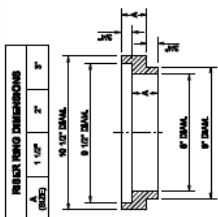
STANDARD PLAN A-10-30-00

SHEET 1 OF 1 SHEET

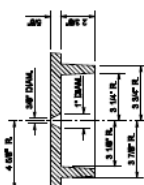
APPROVED FOR PUBLICATION
 Pierce Blalock III
 10-06-07
 Professional Engineer
 State of Hawaii



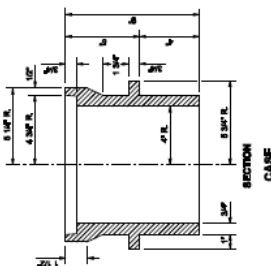
MONUMENT



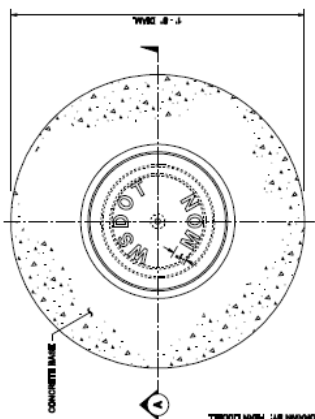
SECTION
INNER RING



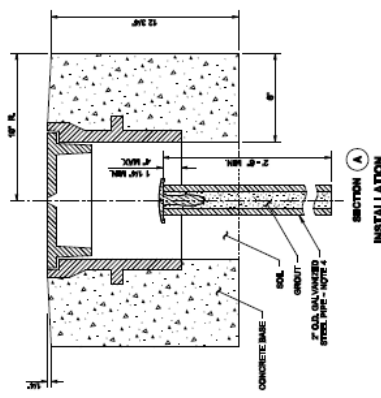
SECTION
COVER



SECTION
CASE



PLAN VIEW



SECTION
INSTALLATION

Title

Description

Materials

Construction Requirements

Measurement

Payment

Stand Alone Requirements

The Special Provisions will follow the format found in the Standard Specifications. Most of the information will appear under the same main headings as the section headings in the Standard Specifications. There will be occasions when the work being performed does not fall under one of the sections in the Standard Specifications, and the designer will have to write a complete new specification, but the format will remain the same, and the designer will simply be responsible for providing all of the information.

Sections 2 through 8 in the Standard Specifications each have the following five sections, and so will every special provision:

- Description
- Materials
- Construction Requirements
- Measurement
- Payment

Because the Standard Specifications are the beginning point for every GSP and project specific provision, before writing anything, the designer needs to first explore the Standard Specifications and see which sections of the Standard Specifications need to be supplemented or revised to get the desired work performed.

If the information is adequately covered in the Standard Specifications, then there is nothing to write. The most difficult part of writing good special provisions is providing the proper amount of information, not too much, not too little, to get the desired results.

Preparing a Special Provision Exercise

Instructions

- Each Group will prepare a stand alone Special Provision.
- Groups will have 20 minutes to create their Special Provision, then 10 minutes to share their work with the class. Each member is to participate in the presentation.
- The instructor will provide the assigned topic.

Recommended Procedure

- ✓ Define Materials
- ✓ Define Construction Requirements
- ✓ Brainstorm tasks (Use verbs)
- ✓ Organize/group related tasks
- ✓ Place tasks in chronological or other logical format
- ✓ Apply “necessary” and “sufficient” tests to your data; revise
- ✓ Write out the procedure
- ✓ Define Measurement and Payment
- ✓ Present to class.

Title

Description

Materials

Construction Requirements

Measurement

Payment

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Pulling it all Together

The end is in sight!

Because the Standard Specifications are the beginning point for every GSP and project specific provision, before writing anything, the designer needs to first explore the Standard Specifications and see which sections of the Standard Specifications need to be supplemented or revised to get the desired work performed.

If the information is adequately covered in the Standard Specifications, then there is nothing to write. The most difficult part of writing good special provisions is providing the proper amount of information, not too much, not too little, to get the desired results.

Assembling the Provision Package

The project office assembles the specification package by integrating the specifications it has developed along with specifications prepared by others.

Quality checking should be an ongoing activity throughout PS&E development.

At a minimum, and prior to turn-in for Pre-Ad review, a check that the various parts of the PS&E are in agreement with each other should be performed.

- Cross-references between plan sheets should be accurate.
- Quantities have been rounded on the tabulations.
- Project totals carried forward to the Summary add up.
- Required details have been prepared and cross referenced.
- Specials have been written for items that need them

Reviews

Submittal to Region

- ✓ Modify provisions; print
- ✓ Initiate review via submittal to Region with Transmittal Memo

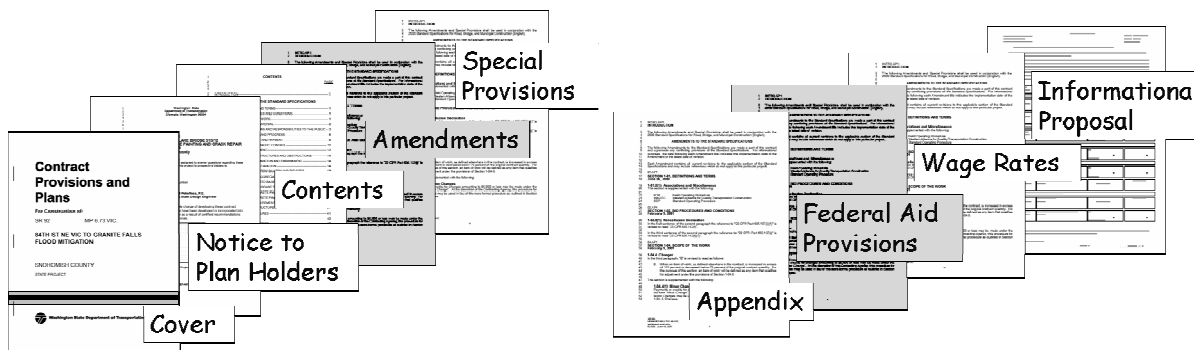
Reviewing the Provisions

- ✓ Pre-Ad Reviews
 - Conducted by Region Plans Office prior to Advertisement
 - Comment and response period
 - May include a meeting
 - Is project biddable?

Ad-Ready

Preparing the Ad-Ready Provisions

- a. Incorporate all appropriate changes resulting from the review process
- b. Certify in accordance with Executive Order E1010.00



Above are a few of the documents which make up the Provision Package.

Advertising the Contract

- By HQ or Region
- Bid period is 2 to 6 weeks depending on \$\$ value of contract and complexity of work
- See Ad & Award Manual (M27-02)

Addendums

- Revisions to contract documents made during bid period
- Issued no later than 2 Fridays before Bid Opening to avoid bid opening delay
- How to--see PPM Appendix 5
- Obtain concurrence *before* proceeding

Documentation

- Finalize documentation per FHWA stewardship agreement and Compliance Review findings
- Justifications
- Approvals
- Archive Word documents
- Certifications by Others

Closing the Project

- Continuous Improvement:
- Recognize project successes
- Identify improvement opportunities
- Track contract Change Orders as construction progresses

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